

CASE STUDY

# Safeguarding Shared Interests Through Cross-Border Cooperation and Management

A case study of the Ethio-Djibouti Transboundary Water Project and the Afar Rift Valley/ Afar Triangle Aquifer



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## Foreword

The geopolitical importance of sound governance of transboundary water resources is growing. The Ethio–Djibouti Transboundary Water Project, which is the subject of this study, is an example of nations coming together to resolve risks to their water security, and is analogous to another similar project on the Rum-Saq transboundary aquifer in Jordan. The Ethio–Djibouti Project secures drinking water supply to one of the Horn of Africa region’s water-stressed countries, Djibouti, from a well-field in Ethiopia, by the border. This Project is financed as part of the Chinese Belt and Road Initiative and serves to extend its global infrastructure network.

Given that the renewable internal freshwater resources per capita of Djibouti and Jordan are 319m<sup>3</sup> and 70m<sup>3</sup> respectively (World Bank Data Portal), both countries have implemented major aquifer based investments (338M USD and 1.5Bn USD, respectively). These investments derive from transboundary aquifers and probably represent the future pathway for many more to come in arid and semi arid regions. Investments such as these provide policy makers with some significant lessons – namely that when the risks to water security loom large – international agreements are reached rather rapidly, irrespective of the slow pace of the evolution of international legal frameworks. The inter country agreements among these countries, on the governance of their transboundary resources, do not rely on the current UN Conventions on transboundary waters. In relation to this, the current in depth study of the aquifers that Djibouti is benefitting from is a welcome development.

This study *Safeguarding shared interests through cross-border cooperation and management of transboundary aquifers* provides timely insights into the discussion on transboundary aquifer systems, of which 468 have been identified around the world. The aquifer system here is the roughly defined Afar Rift Valley/Afar Triangle Aquifer that is shared between Ethiopia, Djibouti, and Eritrea. The hydrogeological configuration of this aquifer system is so far unconfirmed, but there are uncertain suggestions of hydraulic inter connections across national boundaries.

The study gives a picture of the significance of international collaboration over transboundary aquifer resources. It is also a valuable contribution to the discourse on the international human rights law that are not receiving due attention in the water cooperation agenda.

The world’s water resources are under ever-increasing pressure due to growing population and economic development. This is also true of sub surface aquifer resources, which often are the primary source of drinking water (supplying half of the

world's population). With the onset of significant climate variability, aquifers can function as buffers and provide opportunities for enhancing resilience – as long as they are subject to sound governance that should include measures for aquifer replenishment. However, the technical and socio-economic knowledge that is being compiled on them is proceeding at a very slow pace.

This study is produced by the [International Centre for Water Cooperation](#) (ICWC), hosted by the Stockholm International Water Institute (SIWI) under the auspices of UNESCO. The ICWC generates and shares knowledge on water cooperation, contributes to context-specific solutions for cooperation over shared freshwater resources, and facilitates capacity building and policy advice on transboundary water management in connection with peace and regional development.

Shammy Puri

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# Abbreviations

AMCOW	African Ministers' Council on Water
ANBO	African Network of Basin Organizations
BDA	Basin Development Authority
BGR	Bundesanstalt für Geowissenschaften und Rohstoffe (Federal Institute for Geosciences and Natural Resources)
BRI	Belt and Road Initiative
CNY	Chinese Yuan Renminbi
EDTWP	Ethio–Djibouti transboundary water project
EIA	Environmental impact assessment
ESC	Economic, social and cultural [rights]
FAO	Food and Agriculture Organization of the UN
FDRE	Federal Democratic Republic of Ethiopia
GEF	Global Environment Facility
HRWS	Human rights to water and sanitation
ICESCR	International Covenant on Economic, Social and Cultural Rights
ICWC	International Centre for Water Cooperation
IGAD	Intergovernmental Authority on Development
IGRAC	International Groundwater Resources Assessment Centre
ISARM	International Shared Aquifer Resources Management
IWMI	International Water Management Institute
IWRM	Integrated water resources management
l	Litre
m	Metre
mg	Milligram
MAR	Managed aquifer recharge
MoWIE (MoWE)	Ministry of Water, Irrigation and Energy (replaced by Ministry of Water and Energy)
ODA	Official development assistance
OHCHR	Office of the High Commissioner for Human Rights
ONEAD	Office national de l'eau et de l'assainissement de Djibouti (National Office for Water and Sanitation of Djibouti)
PEPER	Producing Safe Drinking Water with Renewable Energy
s	Second
SCADA	Supervisory control and data acquisition
SDG	Sustainable development goals
SIWI	Stockholm International Water Institute
SNNP	[State of] Southern Nations, Nationalities and Peoples'
SSA	Sub-Saharan Africa
TBA	Transboundary aquifer
TDS	Total dissolved solids
TWAP	Transboundary Waters Assessment Programme
UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNESCO-IHP	United Nations Educational, Scientific and Cultural Organization, Intergovernmental Hydrological Programme
UNICEF	United Nations Children's Fund
USD	United States dollar
WASH	Water, sanitation and hygiene
WHO	World Health Organisation

# Executive Summary

Since 2017, water-stressed Djibouti has been supplied with freshwater from Ethiopia, pumped and piped from a well-field in the Kullen Valley, Somali regional state. The groundwater is sourced from a site close to the border between the countries, which may be part of a transboundary aquifer (TBA) called the Afar Rift valley/Afar Triangle Aquifer, or AF059. The boundary of this TBA is unconfirmed but there are indications that there is a hydraulic connection between this aquifer (or perhaps aquifer system<sup>1</sup>), and the well-field and its recharge zones, which are employed by the Ethio–Djibouti Transboundary Water Project (EDTWP).

It is increasingly recognized that groundwater is critical to build resilience to water and food insecurity as well as climate change variability in Africa, where groundwater is the major source of drinking water. The sustainability matters entailed require an understanding of the local and regional scale, and account for needs, practices, and knowledge systems on the ground. They furthermore necessitate consideration of the general duty of cooperation under international law, as codified in many international treaties and bi- and multilateral agreements. This obligation also applies to the EDTWP – whether the aquifer is shared or not – in particular because of its integrated place in human rights law.

The interest in groundwater resources, and in aquifers as their ‘hosts’, is increasing along with growing demand and need for climate change adaptation, policies, and action. Arguments based on the international human rights framework are, however, not receiving due attention in the water cooperation discourse. Given this situation, the objective of this report is to address the duty to cooperate that nation states have in relation to each other, their citizens, and the world community concerning shared groundwater resources. More specifically, the report seeks to:

- Understand forms of cooperation between neighbouring and other countries that do not readily fall under the ‘aquifer state’ notion,<sup>2</sup> going beyond what applies to conventional, well-defined TBA systems;
- Contribute with insights on a scarcely studied region’s handling of water security and problems with ensuring ecological sustainability in the long term, using the cases of the EDTWP and the AF059 TBA as illustrations.

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<sup>1</sup> In the Draft Articles on the Law of Transboundary Aquifers (UNGA, 2008), ‘transboundary aquifer’ or ‘transboundary aquifer system’ means, respectively, “an aquifer or aquifer system, parts of which are situated in different states”, Art. 1(c).

<sup>2</sup> The Draft Articles defines ‘Aquifer State’ as “a State in whose territory any part of a transboundary aquifer or aquifer system is situated”, Art. 1(d).



As it is not yet established whether the Kullen Valley is interconnected with the AF059, much of the policy and law discussion in this report is theoretical, serving to highlight the need for groundwater governance and management under unsettled circumstances, as well as for improved data on TBAs.

## **The EDTWP as a case of cross-border water supply**

Located in the Horn of Africa, Ethiopia and Djibouti are both highly susceptible to climate change as well as to the environmental change and human dimensions of recurrent drought and inadequate water governance. The EDTWP pumps groundwater from a well-field to serve neighbouring Djibouti, thereby greatly improving its water security situation. Designed to transmit 100,000 m<sup>3</sup> water daily to meet domestic and industrial needs, the project is regulated in an undisclosed, 30-year agreement between the countries under which groundwater can be extracted for free. The EDTWP has mobilized almost 370 million USD as part of China's Belt and Road Initiative for infrastructure development and the water export project is thereby also of geostrategic importance to its financier, a Chinese state-owned bank, and the likewise Chinese state-owned contractor that operates the well-field.

With many contract details being opaque and confidential, and in the absence of any environmental impact assessment, it is unknown whether the recharge zones of the well-field have been identified and if the groundwater flow and balance have been determined. Anecdotal evidence, observations, and mapping suggest that the recharge of the well-field takes place in the surrounding mountains, and it is thereby possible that the cross-border project is also of trans-regional nature, here referring to that it may involve as many as four different regional states in Ethiopia. From a sustainability perspective, accounting for the area's arid climate and considerable inter-annual rainfall variability, risks of over-abstraction and water resources stress cannot be ruled out in the long term.

From a governance point of view, the initial decision-making and project design seem to have taken place entirely at the federal level in Ethiopia, excluding the respective jurisdictions of the Somali regional state as well as what was then the Awash River Basin Authority. Even today, it is unclear to what extent the water supply needs of the local agro-pastoralist communities have been taken into consideration and if adequate risk management is being carried out. A precautionary approach requires pro-active prevention of over-draft from the aquifer system, and concerted efforts not only by the concerned parties but also the international community, which has interests in safeguarding development and poverty alleviation through enhanced water security.

The International Groundwater Resources Assessment Centre's (IGRAC) maps and information about the AF059 do not include the Kullen Valley. However, in the experience of the UN Children's Fund (UNICEF), from hydrogeological explorations and drilling in the area, the local population has knowledge of the recharge areas and the groundwater flow direction, which suggests that there is a hydraulic connection. A closer study to collect data from hydrochemistry, well drilling and pumping tests, geophysical surveys, and other methods supported by regional groundwater modelling will be critical to establish and characterize the aquifer systems and delineate the extent of the TBA in question more precisely. Such studies should be conducted in a participatory manner, involving not only the federal ministries, regional states, and other concerned Ethiopian authorities as well as the neighbouring aquifer states, but also local communities with knowledge about the landscape and underground conditions.

However, the EDTWP countries' appetite and capacity to explore the 'transboundariness' of the Kullen Valley in relation to the AF059 is uncertain. This reinforces the need for international cooperation and technical assistance. While China has an express policy to practice 'good neighbourliness' in line with the Five Principles of Peaceful Coexistence, transboundary issues have traditionally been geopolitically sensitive to Ethiopia.

## **Transboundary aquifer cooperation premises and the role of human rights**

In essence, international law is created by autonomous states to govern their relations with fellow states. Its application also involves environmental problems that arise between them, among other things with respect to (ground)water resources including the control of pollution and resources depletion. International law also defines states' legal responsibilities in their treatment of individuals, set out in human rights law as guarantees against the conduct of an individual's own government. International human rights law binds the three EDTWP countries as they are all parties to the International Covenant on Economic, Social and Cultural Rights (ICESCR). The requirements are, by nature, general and, at times, constructively ambiguous. The (non-binding) UN General Comment No. 15 on the right to water explains that rights-holders are entitled to maintain access to existing water supplies. The right corresponds to the state's obligation to refrain from actions and interventions, and from interfering, directly or indirectly, with such water sources. In the case at hand, Ethiopia is bound to respect existing water arrangements in the Kullen Valley and elsewhere that may be impacted by the EDTWP. In addition, it must not deprive pastoralists of their means of subsistence.

At the domestic level, the duties form part of the UN State Parties' obligation to take appropriate measures to the maximum of their available resources, including through receiving technical assistance, towards realizing the right to water and other entitlements in full. States must also respect the enjoyment of the right to water by refraining from activities with direct or indirect negative impact on the enjoyment of rights outside their own territory, but cannot be held responsible for not actively realizing the human rights of people outside their territory. In the case of the EDTWP, Ethiopia seemingly has not paid due respect to the procedural 'good governance' principles of providing the concerned communities with information, facilitating their participation in public decision-making, or providing access to remedies.

Under the international human rights regime, so-called donor countries' duty to cooperate has a degree of extraterritorial reach: providing technical assistance in the form of financial aid, grants, and loans, and also arranging meetings, partnerships, technical skills training, and practical advisory services. In the literature, interpretations of what this entails suggest that donors set aside official development assistance, much in line with what is expected under the Sustainable Development Goal (SDG) 6.a.1 and 17.2,<sup>3</sup> as part of the political commitments made by governments under the 2030 Agenda. Here, it is noticeable that SDG target 6.a.1 also covers much of the cooperation and assistance stipulated by human rights law. In practice, a critical part of the cooperation consists of interventions such as hydrogeological assessments and borehole drilling for water supply that, for instance, UNICEF is involved in alongside international non-governmental organizations and more traditional charity actors.

As for international water law, collaboration over shared groundwater and aquifers becomes a challenge without legal agreements and when no formal or informal communication – such as exchange of information and prior notifications – takes place. The uncertainty that generally characterizes this invisible water resource has profound implications on TBAs. Generation of data and communication of the same are, therefore, fundamental to optimal interstate relations and sustainable utilization. Whether such matters are covered by the understanding of 'international cooperation' is a critical question. It cannot yet be said with certainty that a legally binding duty to regularly exchange relevant information for management of shared aquifers exists under customary international law, and expert views diverge on how to

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<sup>3</sup> Indicator 6.a.1: "Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan"; Target 17.2: Developed countries to implement fully their official development assistance commitments, including the commitment by many developed countries to achieve the target of 0.7 per cent of gross national income for official development assistance (ODA/GNI) to developing countries and 0.15 to 0.20 per cent of ODA/GNI to least developed countries; ODA providers are encouraged to consider setting a target to provide at least 0.20 per cent of ODA/GNI to least developed countries.

interpret state practice and *opinio juris* to this effect. Regardless, such a principle is clearly emerging and has found its way into several soft law instruments on TBAs that have a guiding, normative force. One example is the Draft Articles on the Law of Transboundary Aquifers, prepared by the International Law Commission and adopted by the UN General Assembly.

For agreements or arrangements on TBAs to be worked out, there appears to be a twofold premise, in theory if not always in real life. First, there is a common *scientific* understanding that two or more sovereign states indeed share an aquifer (or aquifer system). Second, there is *political will* on both (or all) sides of the border to develop a joint normative framework<sup>4</sup> to govern it, by strengthening cooperation and protection. In practice, though, the ability to ‘see the unseen’ groundwater resources and investigate whether hidden aquifer systems cross political, administrative borders – including domestic, trans-regional borders – is riddled with complexities and high costs.

## Water security and global interdependence

On the face of it, the EDTWP is a case of a contractual agreement, serving the involved countries’ different but strategic needs: drinking water supply for water-stressed Djibouti; access to a deep seaport for landlocked Ethiopia; and an extension of China’s global infrastructure network. As such, it can improve the social and economic collaboration between Ethiopia and Djibouti under a ‘give and take’ principle as well as foster the political relationship between Djibouti and China. It is, however, also of interest as a joint project ‘in the spirit of cooperation’, one that is perhaps entered into also on moral grounds as a result of hydro-solidarity between sovereign states.

The EDTWP does not involve any of the conventional aspects of potential water conflicts that need to be averted to attain water security; that is, the pumping of large volumes of groundwater close to the border in Ethiopia does not seem to cause harm to Djibouti. Rather, at present, it serves the latter country’s population and contributes to the fulfilment of the human right to water as well as several SDGs.<sup>5</sup> A cross-border water supply project of the kind seen in the EDTWP is not a new solution to water insecurity. Water transfer – whether large-scale engineering interventions to remove and divert bulk water within and between river basins, or any other infrastructure to move water from one place to another for human

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<sup>4</sup> For instance, one of the SDG 6.5 indicators monitors progress towards transboundary cooperation by tracking the proportion of transboundary basin area with an “operational arrangement” for water cooperation, see <https://www.sdg6monitoring.org/indicator-652/>. Neither Ethiopia nor Djibouti has, to date, reported on this.

<sup>5</sup> Primarily Goal 6 on clean water and sanitation, but also Goal 3, good health and well-being, 13, climate action, and 17 on partnerships for the goals.

utilization – takes place in response to freshwater being in demand elsewhere. Transfer from one country to another may be regulated as export under Free Trade Agreements. However, though the EDTWP does not constitute commodification of water but rather is an example of international collaboration, serving a severely water stressed country, the hydro-politics behind the scenes are concealed from scrutiny. The tripartite contracts deny local stakeholders project benefits as well as the opportunity to be part of the governance process and management decisions. By turning to China for commercial loans instead of seeking traditional development assistance from donors, the two African countries involved can avoid scrutiny of their democratic reform agendas as well as their human rights realization and SDG reporting. The transboundary issues actualized by the EDTWP have geopolitical impacts, which the countries involved seemingly prefer to keep disclosed and away from public scrutiny.

Moreover, sustainability of water supply projects is recognized as a major challenge in sub-Saharan Africa and often not properly integrated into major phases of project design and implementation. For instance, integrating sustainability measures into drinking water development efforts is crucial to maintain the minimum acceptable water flow throughout the economic life of infrastructure. Such concerns must address the source of the water, and social, environmental, institutional, technological, and economic development aspects of the region in general and the project area in particular in order to ensure long-term viability.

There are several challenges resulting from uncertainties around the EDTW project governance and the sustainability of the groundwater resources. The power division issues in Ethiopia, and rule of law aspects connected to the project agreement and arrangements, add complexity. Transparency, accountability, and a prioritization of the most vulnerable are other issues at stake. It is unknown whether regular meetings take place between the countries concerned, and if those are only between Ethiopia and Djibouti with focus on the precarious electricity situation that has stalled much of the pumping and distribution since the inauguration.

In 2021, the first desalination and drinking water production plant in sub-Saharan Africa was inaugurated in Djibouti. Financed mainly by the European Union and powered by a wind farm, it now complements the groundwater distribution from Ethiopia. Through this move to become more self-sufficient through an autarkist policy, the smallest country of the three has now secured its long-term water supply needs while reducing its reliance on import from Ethiopia as well as on commercial loans from China.

Cooperation over water supply from the Kullen Valley has – nevertheless – led to greater interdependence between Ethiopia and Djibouti. The two countries share an aquifer, the exact boundaries of which are not yet identified. Joint arrangements to

protect this transboundary resource could potentially contribute to improved relations and sustainability between the neighbours. In turn, this could not only safeguard future access to water but foster interrelated shared interests that go beyond the immediate benefits of the EDTWP, whether it is shown in the future that the source of the water is a domestic aquifer or a TBA. In times when the narrative is often shaped by national sovereignty and the debate is increasingly framed in terms of securitization arguments in favour of, or in opposition to, the sharing of water resources, this case speaks for collaboration, and contains a substantive kernel of potential for international cooperation.



Pastoralist communities in Djibouti have been hit particularly hard by the droughts. Image courtesy of International Federation of Red Cross and Red Crescent Societies.

## 1. Introduction

Water stress characterizes large parts of the world. Droughts in the Horn of Africa have been increasing in severity and frequency, aggravated by climate change, the El Niño/La Niña oceanic and atmospheric phenomenon, desertification, and land degradation. The United Nations (UN) Food and Agriculture Organization issued a pre-famine alert in 2017 and at the beginning of 2022, the region faced an exceptional prolonged and persistent agro-pastoral drought sequence. Three consecutive rainy seasons had failed, affecting the Somali region in Ethiopia as well as Kenya and Somalia. The UN World Food Programme reported (2022) that the worst affected areas – experiencing the driest conditions since 1981 – included the southern pastoral areas of Ethiopia. Food and drinking water security was severely threatened.

In Africa, groundwater and aquifers<sup>6</sup> play a fundamental, if not yet fully appreciated, role in supporting economic development and human well-being, as well as maintaining many aquatic ecosystems. At the aggregate level, groundwater is the major source of drinking water on the continent and its use for irrigation is forecast to increase substantially to combat growing food insecurity; the resource is strategic to build resilience and in buffering the effects of climate variability (Gaye and Tindimugaya, 2019; Grönwall and Oduro-Kwarteng, 2018; MacDonald et al., 2012). In sub-Saharan Africa (SSA), shallow aquifer systems are relied on as the main water resource available to rural communities. Information on the sustainability and vulnerability of groundwater abstraction is becoming increasingly important as groundwater development grows in importance (Banks et al., 2020). Unlike many regions, though, SSA has yet to undergo a groundwater revolution<sup>7</sup>; for most countries here, current groundwater use has been estimated to remain under 5 per cent of the national sustainable yield. Considering enduring poverty and recurrent humanitarian crises, such an under-utilization can be seen as unjustifiable (Cobbing and Hiller, 2019). Many actors recommend investment in expanding groundwater development as an integral component of national water resources strategy in SSA, in

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<sup>6</sup> The interchangeable use of the words ‘groundwater’ and ‘aquifer’ is increasingly questioned as the former describes the liquid resource while the latter describes the container (and possibly the water within it), itself being a resource from, for instance, nature-based solutions and climate change resilience perspectives. The question that some are now asking is whether this distinction is important and, if it is, to what effect. Eckstein, personal communication.

<sup>7</sup> The conceptualization of a groundwater revolution here alludes to the so-called green revolution, mainly taking place in developing countries, where a large increase in crop production was achieved through artificial fertilizers, pesticides, and high-yield crop varieties. In South Asia and India in particular, it has been supported by intensive inputs of groundwater, in turn made possible by borehole drilling and tubewell technology for irrigation.

particular to accelerate farmer-led smallholder irrigation (Shah et al., 2020; World Bank, 2018).

Meanwhile, others warn of the risks of physically non-sustainable withdrawal of groundwater that may deplete localized water supply if development becomes uncontrolled. Over-exploitation of underground resources is a global problem and ticking time-bomb for food security, land subsidence, and deterioration of groundwater-dependent ecosystems. Renewability and accessibility issues need to be addressed to counter irreversible aquifer deterioration and conflict between stakeholders and sectors, and to handle challenges caused by inadequate governance and institutional frameworks, including the lack of sufficiently comprehensive groundwater information (Bierkens and Wada, 2019; Edmunds, 2012).

As pressures on groundwater resources increase with economic development, population growth and climate change, it is increasingly important to understand transboundary aquifers (TBAs) (Nijsten et al., 2018). These are as essential a component of global water resources as transboundary rivers; yet, their recognition in international water policy and legislation is still very limited (Puri and Aureli, 2005). Cooperation over the governance and management of TBAs is imperative, alongside dialogue resulting in stable agreements between the concerned aquifer states.

As of the 2021 update, 468 TBAs have been officially identified around the world. In 2018, 72 TBAs were recognized in mainland Africa (Nijsten et al., 2018). However, a recent study in Malawi identified 38 TBA units shared with the country's neighbours, in contrast to a previous estimate of three. It is likely that other countries have many more TBAs than previously thought, giving rise to a need to prioritize which ones receive resources and funds for in-depth assessment and subsequent management (Fraser et al., 2020). This reflects how little is yet known about underground resources, as well as perhaps the lack of preparedness to take joint custody of shared but 'invisible' water resources.

Delineation of TBAs is regularly done with a regional scale in mind. Despite the fact that the borders and extent of many shared aquifers and groundwater systems are not yet firmly established, international cooperation as regulated in customary and international law is of interest in this case. Furthermore, as with many such aquifers whose characteristics are not yet confirmed, it is vital to understand local level geohydrological aspects and socio-economic dependence on groundwater resources.



## 1.1 Arranging for water supply, sourcing from a neighbour's aquifers

Africa is widely held to be highly vulnerable to climate change and the Federal Republic of Ethiopia is often cited as one of the most extreme examples, with an economy that is sensitive to large scale hydrologic drought (Conway and Schipper, 2011). Ethiopia is riddled with climate-induced displacement mainly caused by drought and floods, but also faces significant internal displacement due to conflicts. When recognizing that global freshwater vulnerability is a product of environmental and human dimensions, however, the Hashemite Kingdom of Jordan, the Republic of Yemen, and the Republic of Djibouti come out as the top three water scarce nations in the world. For those three nations, vulnerability arises from an overall lack of water resources coupled with multiple endogenously and exogenously-derived management issues (Padowski et al., 2015).

Since 2017, the Ethio–Djibouti Transboundary Water Project (EDTWP) has pumped groundwater from boreholes in Ethiopia and distributed it to neighbouring Djibouti. The project is built to transmit some 100,000 m<sup>3</sup> water daily from the Kullen (or Kulan) Valley in the Ethiopian Somali regional state, about 100 km from the border between the countries (Map 1). At full capacity, it aims to meet Djibouti's domestic and industrial needs of up to 750,000 residents (approximately 75 per cent of Djibouti's population) at an affordable price (Dreher et al., 2017; Geda, 2014).



Map 1. Location of the study region; the AF059 transboundary aquifer (from IGRAC and TWAP, 2015). General flow patterns inferred, based on findings by Ministry of Mines & Geological Survey of Ethiopia, 2018.

According to an undisclosed, 30-year agreement between the countries, groundwater can be extracted in Ethiopia free of charge (Mormul, 2016; ZeHabesha, 2014). To Ethiopia, one of Africa's most populous countries, the need for access to Djibouti's natural deep-water port, the country's main physical asset and a critical gateway to land-locked Ethiopia, was a driver behind the deal. It simultaneously serves to improve the socio-economic cooperation between the two African countries that see themselves as the engines of closer cooperation within the regional Intergovernmental Authority on Development (IGAD)<sup>8</sup> grouping. The deepened ties between Ethiopia and Djibouti could be a model for the region.

Meanwhile, this water transfer project is also of geostrategic importance to the People's Republic of China. The project is enabled by government-backed financing of loans from the Export–Import Bank of China (China Exim Bank) and the contractor that operates the well-field, CGCOC Water Co., Ltd., is state-owned. The Washington Post and others have noted that Chinese entities have also financed and built Africa's biggest and deepest port, a railway to Ethiopia, the country's first overseas naval base in Djibouti, and an undersea cable that will transmit data from state-owned telecom companies. Furthermore, Beijing is funding a pipeline to transport natural gas from Ethiopia to Djibouti's port for export to China (Bearak, 2019). The China Maritime Studies Institute stresses that the People's Liberation Army (PLA) base at Djibouti is part of a network of supply, logistics, and intelligence hubs across the Indian Ocean and beyond. The interest in Djibouti is significant in relation to one of China's 'overseas strategic strongpoints', a concept used by Chinese officials and analysts to describe foreign ports with special strategic locations and economic value. The comprehensive nature of the country's investments and operations involve coordination among state-owned enterprises and private firms to construct a port, as well as railway, road systems, and pipeline infrastructure, to promote finance, trade, industry, and resource extraction in inland markets (Dutton et al., 2020).

The series of cross-border infrastructure projects funded mainly by China makes it the new power broker in the region (AFP, 2016). Yet, beyond the observation that the water pipeline runs parallel to the Addis Ababa–Djibouti railway (Dutton et al., *ibid*), the critical importance of its involvement in ensuring a safe source of water for East Africa's smallest nation has flown under the radar of most commentators.

The Kullen Valley lies in the Ethiopian lowlands, characterized by an arid climate and considerable inter-annual rainfall variability. This area is drought prone and marked by considerable surface water availability problems. Due to the erratic and

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<sup>8</sup> The IGAD presently has eight member states: Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan, and Uganda. See <https://igad.int/>.

unreliable nature of rainfall, surface waters are generally scarce, and groundwater remains the sole resource supplying water for domestic needs and for livestock. However, the effective use and development of groundwater for rural water supply is hampered due to the complex nature of the hydrogeological system of this basin (*see next section*). As is common in the arid area of Ethiopia, the percentage of households using improved drinking water sources is the lowest in Ethiopia (UNICEF, 2020; World Bank, 2020).

The area is situated in the north-eastern part the Awash River basin (and Shinile sub-basin) that is shared with Djibouti and has very minor parts in Eritrea and Somalia (see TWAP Rivers<sup>9</sup>) in the far northeast. According to the map of TBAs compiled by the International Groundwater Resources Assessment Centre (IGRAC, 2021; IGRAC and TWAP, 2015),<sup>10</sup> Ethiopia and Djibouti also share the transboundary Afar Rift Valley/Afar Triangle Aquifer (AF059), together with Eritrea – with the disclaimer that the delineation is ‘unconfirmed’.<sup>11</sup>

Compared with how the AF059 is currently outlined, the EDTWP well-field is located outside. The existing, but preliminary, hydrogeological assessments upon which the IGRAC maps are based do not indicate that the Kullen Valley is part of the AF059 aquifer system – because the hydrogeologic system, aquifers configuration and hydraulic connectivity between the two have not been fully explored. However, there are major gaps in knowledge with respect to both the aquifer system (including recharge and discharge zones of importance for the well-field), and the delineation of the AF059. This type of data gap is not unique to the AF059; in fact, it is common to TBAs. In this case, however, it is urgent to explore the possibility of a hydraulic connection because it may have an impact on the governance and management of the resource that the EDTWP countries collaborate over.

## 1.2 Report objectives and scope

Interest in cross-border groundwater resources and in transboundary aquifers as their ‘hosts’ is increasing globally along with growing water demand and a need for climate change adaptation. Coupled with arguments that the international human rights framework is not receiving due attention in the water cooperation discourse, the objective of this report is to address the duty to cooperate that nation states have in relation to each other, their citizens, and the world community concerning shared groundwater resources. Specifically, the report seeks to:

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<sup>9</sup> <http://twap-rivers.org/>.

<sup>10</sup> The information sheet was produced as part of the Groundwater Component of the GEF Transboundary Water Assessment Programme (GEF TWAP).

<sup>11</sup> Prior to the update of the IGRAC map and the codes in 2021, this TBA was referred to as AF59 and marked as ‘partially confirmed’.

- Understand forms of cooperation between neighbouring and other countries that do not readily fall under the ‘aquifer state’ notion, going beyond what applies to conventional, well-defined TBA systems;
- Contribute with insights on a scarcely studied region’s handling of water security and problems with ensuring ecological sustainability in the long term, using the cases of the EDTWP and the AF059 TBA as illustrations.

It is of relevance to discuss the governance principles and decision-making processes behind the scenes of the EDTWP. The management measures to develop and protect the groundwater resources at stake, the aquifer system, and the well-field asset are equally important. This paper centres on the governance and management situation in Ethiopia, the aquifer state where the boreholes, well-field infrastructure, and the recharge zones are located.

Although arguments based on the international human rights framework are often ignored in the water cooperation discourse, a human rights-based approach (HRBA) should, however, be applied when analysing the type of project that the EDTWP constitutes. Here, it serves to complement the discussion on international cooperation and governance.

The HRBA has, it can be argued, brought a paradigm shift for development aid programming based on rights, risks, and core values. For instance, with respect to safe drinking water, the approach focuses on identification of justiciable rights and corresponding duties that prioritizes the most vulnerable; it allows for abandoning a dependence on charity for meeting peoples’ basic needs. An effective rights-based approach requires capacity-strengthening, both among actors with obligations (duty-bearers) and those with rights, claims and entitlements (rights-holders)(Cap-Net et al., 2017; UNICEF, 2021).

### **1.3 Methodology and report structure**

This report has employed mixed methods for triangulation to increase the validity of the findings. The research design includes a case study of the EDTWP and of the unconfirmed transboundary aquifer AF059, which was selected to illustrate the need for more robust information about and improved understanding of TBAs. A literature review of secondary sources includes published material, grey literature, and newspaper articles. This is complemented by a legal content analysis of documents and texts adopted by UN bodies, such as treaties, resolutions, and reports, as well as of Ethiopian law. Previous groundwork [commissioned] by the Ethiopian Government’s Ministry of Water and Ministry of Agriculture since the 1970s has been key to develop an understanding of the local situation on the ground. Likewise, UNICEF’s engagement in the Somali Region and in Djibouti as well as insights

acquired by Professor Wakgari in his capacity as a consultant to the EDTWP at an early stage of the project have been indispensable. The paper also builds on observations and knowledge gained from geological investigations in Ethiopia including maps developed by the Ministry of Agriculture, and by the Geological Survey of Ethiopia and Czech Development Agency, with partners. The study also benefits from personal communication with representatives of Ethiopian agencies: the then Ministry of Water, Irrigation and Energy (MoWIE, now Ministry of Water and Energy), the erstwhile Basin Development Authority (dissolved in relation to the new government formed in October 2021), and the Awash Basin Development Office; international law scholars; IGRAC; IGAD; and a former consultant for the Oromia Water Works Design and Supervision Enterprise (OWWDSE, a company contracted for project supervision in the EDTWP's construction phase).

A limitation of this report is that field work was not possible, due to pandemic-related travel restrictions and the political tensions (escalating into civil war) in Ethiopia since November 2020. The undisclosed nature of the tripartite EDTWP agreement has also limited the analysis.

This report is structured into the following sections:

**Section 2** aims to provide as much information about the geographical setting of the region in question as has been possible to collect and analyze given the study's methodological limitations, the preliminary information on the TBA numbered AF059, and the publicly disclosed details of the Ethio–Djibouti Transboundary Water Project. The level of detail is motivated by the desire to provide a full picture of the known and unknown facts and data, which are immensely relevant to future decisions on the further exploration of the TBA's delineation.

**Section 3** addresses the framework for groundwater governance and management. It includes the institutional setup in Ethiopia and identifies the actors that were (are), or should have been, involved in decision-making on the project, and then describes the domestic law situation governing it. Sub-sections describe applicable policy and planning measures or relevance, as well as management

**Section 4** provides a theoretical description of the duty to cooperate under international law, international human rights law, and the Sustainable Development Goals, that are of relevance to TBAs and the case study. It also gives an overview of the international law on TBAs. The section seeks to give a comprehensive portrayal for the audience with an interest in the field, especially as the human rights law dimension is largely missing in most analyses of TBAs and water cooperation. Here, however, it is used to underpin the argument that this framework is critical to understand the breadth of international cooperation and assistance also for water supply collaboration of the type seen in the EDTWP.

**Section 5** discusses the duty to cooperate in relation to different relevant themes: cooperation over TBAs; human rights aspects of cooperation in the case of the EDTWP; the project regarded from a water transfer and export perspective; and water security aspects in relation to governance. It touches on the concept of hydro-solidarity but does not claim to analyse this. The section draws up future steps for the particular cases of the EDTWP and the AF059 in terms of the project site being part of a TBA or not and makes a call for the grounded knowledge among locals to be considered in this pursuit. Finally, it provides practical recommendations for the continued management of the Kullen Valley and recharge areas.

**Section 6** provides concluding remarks on how transboundary groundwater resources add complexity to governance processes and to the extraterritorial scope of human rights. It makes the case that while TBAs necessitate diplomacy and scientific assessments, they build interdependency and can trump narratives shaped by national sovereignty and securitization arguments.

## 2. Geographical setting, the EDTWP, and the AF059

The short-term success and long-term sustainability of the EDTWP depend on the water availability and hydrogeological conditions as well as the socio-economic fabric of the study area. Similarly, updating the information and map for the transboundary aquifer (AF059) requires baseline data and knowledge. After presenting known details about the water supply project and the underpinning agreement between the three countries involved, this section gives an account of the groundwater conditions in the wider geographical area in question. Finally, the official data available for the AF059 are described.

### 2.1 The Ethio–Djibouti Transboundary Water Project

In 2012, the drought in the Horn of Africa caused a major food crisis, generated widespread water shortages, and threatened the livelihood of millions of people (World Bank, 2012). Djibouti's National Office for Water and Sanitation (ONEAD) turned to Ethiopia, the neighbour with whom it maintains longstanding relations, to alleviate the water stress by initiating a cross-border water supply project for the transport of drinking water from Ethiopia (African Water Association, 2018). The Chinese Ministry of Finance and the CGCOC Group Co., Ltd. (formerly known as the Overseas Construction Group) developed a common vision to source water from Ethiopia and transport it to Djibouti across the border. Once the concept was put forward, Djibouti took the initiative to sign agreements with Ethiopia and the CGCOC Group (Yifeng and Zelele, nd).

A memorandum of understanding between the three countries was signed on 3 September 2012, followed by a bilateral agreement between Ethiopia and Djibouti signed 20 January 2013 (both of which are unpublished). The agreement signed in 2014 gives “full and exclusive rights” to Djibouti to draw 103,000 m<sup>3</sup> daily, a total of 37 Mm<sup>3</sup> annually, for the next 30 years. Djibouti would pay compensation to residents of Shinile, Ali Sabih, Dilhil, and Ara towns in Ethiopia, as well as towns in Djibouti that may be affected by the project (Geda, 2014). China Aid Data reports that a signing ceremony of a loan agreement between Djibouti and the Exim Bank of China was held in September 2013. According to this agreement, China agreed to fund the equivalent of 322 million USD for a cross-border water project to be launched before the end of the year, and implemented within 24 months. The loan is for 20 years, with a seven year grace period, at an annual interest rate of 2 per cent plus two commissions (one for management and one for commitment) of 0.25 per cent each (Dreher et al., 2017). The “financing agreement for the construction

project of extraterritorial water supply infrastructure” was ratified by law in Djibouti in 2014 (Loi N° 40/AN/14/7ème L).

The formal, but never disclosed, international agreement between Ethiopia and Djibouti, entered into by the Government of Ethiopia, was subsequently ratified by the country’s House of Peoples’ Representatives (the lower house of the Federal Parliamentary Assembly) (Government of Ethiopia, 2014). Through the Proclamation 856/2014, the Ministry of Finance was empowered to implement the Agreement “in collaboration with other concerned public bodies”. As stipulated in the Constitution, the Federal Government “shall formulate and implement foreign policy; it shall negotiate and ratify international agreements” (Art. 51(8)).

On 27 March 2018, the Djibouti Council of Ministers approved a Phase II loan agreement with the Chinese Exim Bank, for 303,660,000 CNY (then corresponding to 43,380,000 USD) “relating to the additional financing of the cross-border project water supply from Ethiopia to Djibouti” (Government of Djibouti, 2018). Similar loan conditions apply as under the 2014 agreement, but the repayment period now spans 13 years.

The project involves a Chinese private contractor, the CGCOC Water Co., Ltd. (a subsidiary of the CGCOC Group), whose first water supply project in Ethiopia was completed in 2009. The company is also in charge of operating the 44 km long network of water collection pipes connecting the boreholes. The infrastructure facilities feature disinfection, a three-stage pressurized pump lift, gravity flow pipeline transportation for over 200 kilometres, remote signal transmission and automatic control. The total length of the pipeline, including the water distribution pipeline, is about 374 kilometres (Yifeng and Zelele, nd). The groundwater quality is within WHO standard, but there is a treatment plant serving Djibouti city, the country’s capital.<sup>12</sup>

The CGCOC Water company was contracted based on an Engineer, Procure, Construct project delivery method, under which it is fully responsible for the design, source, quality, and implementation.<sup>13</sup> The project owner on the Djibouti side is ONEAD,<sup>14</sup> a state-owned enterprise that is the country’s only agency in water and sanitation. A supervisory control and data acquisition (SCADA) system of software and hardware elements was set up on-site in the Kullen Valley, to record and transmit data from the industrial equipment.

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<sup>12</sup> It is not clear why the water is treated a second time before distribution in Djibouti city.

<sup>13</sup> An EPC model typically transfers a higher risk to the contractor, making it the sole responsible, for instance, for unknowns like hidden site conditions.

<https://www.lexology.com/library/detail.aspx?g=7e8d69d7-b936-4891-aab8-d69690c3cc71>.

<sup>14</sup> <https://www.onead.dj/projet-transfrontalier-dapprovisionnement-deau-potable-ethiopie-djibouti/>



The Ethiopian ZeHabesha media outlet<sup>15</sup> heavily criticized the project when it was made official in 2014. It reported that it “heard that the local residents of the area around the water mining project were instructed to evacuate to some where at least 70 km away as soon as possible by the Federal Government forces. The Ogaden National Liberation Front has issued complaints on this forced eviction of residents”. ZeHabesha questioned why it was necessary to relocate residents in a sparsely populated region where the local population live on agro-pastoralism without mechanized farms and utilization of polluting chemicals that can adversely affect the groundwater resources (ZeHabesha, 2014). A “groundswell of discontent” was reported on online sources after the announcement of the deal, alleviated in part when, in July 2014, it was officially admitted that Djibouti would pay compensation to the Ethiopian residents affected by this water project (Mormul, 2016).

The construction of 28 boreholes – on average 500 m deep (ranging from 520 to 460) – and necessary infrastructure began in March 2015. Each is pumped at 100 l/s, and four of these wells are designated as standby wells (Wakgari, personal communication). The boreholes partially penetrate the scoriaceous and fractured basaltic aquifer, which is confined by a thick clay conveying unit.

In February of the following year, it was reported that the project was almost being finalized. However, it was not until June 2017 that the CGCOC Water announced that together with “Water Company, Ethiopian Department of Management, Djibouti Manager, Ethiopian Water Company [sic]”, it had carried out a ceremony in Djibouti to celebrate test runs confirming that the project will provide “high-quality clean water in line with WHO drinking water standards” (CGCOC Water, 2017). Shortly after, the project manager said operations would commence about three months thereafter (China.org.cn, 2017).

By December 2017, parts of Djibouti – the capital city, the country’s second largest city, Arta, as well as three regions – had started to receive water. The average well yield is 80 l/s and 24 wells are in operation today (four more are on standby). No water table drawdown has been noticed; this may indicate that the water supply is still far from maximum capacity [Wakgari, personal communication].<sup>16</sup>

In January 2020, Djibouti submitted a periodic report to the Committee on the Rights of the Child (OHCHR, 2020, para. 34), stating: “Conscious of the key issue

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<sup>15</sup> The ZeHabesha was founded in Minnesota, USA, in 2008, from where its executive editor publishes English and Amharic-language news articles. The reporters on the ground in Ethiopia remain unidentified to ensure their safety. The founder escaped the country in 2005 after the regime of then-Prime Minister Meles Zenawi arrested him multiple times for publishing stories that were critical of the TPLF administration. <https://sahanjournal.com/profiles/ethiopian-journalist-zehabesha/> (14 July 2020; accessed 1 July 2021).

<sup>16</sup> It has not been possible to obtain any monitoring data, for instance from the SCADA system, for this study.

of water, particularly its impact on the survival and development of children, the Government of Djibouti has just put into operation the Djibouti-Ethiopia cross-border water supply project. The collection system originating in Ethiopia consists of 28 boreholes linked to two reservoir generating stations and connected to three regions including the capital (Djibouti City)”.

The town of Dewele and a few other Ethiopian communities along the route of the water supply network are also supplied by this system, together with three Djiboutian towns between the border and Djibouti City. Not many places are supplied because the system operates a high-pressure pipe requiring electric pumps. The well-field is at approximately 670 metres above sea level<sup>17</sup> and the highest point of the network is at 970 metres (Yifeng and Zelele, nd). This challenging terrain requires a reliable source of energy to run the pumping system, making it susceptible to temporary downtime. The bottleneck for the water supply has been, and still is, electricity. During 2019, Ethiopia rationed electricity for domestic and industrial customers, and suspended electricity exports to Djibouti<sup>18</sup> and Sudan after a drought-induced drop in water levels in hydroelectric dams led to a production deficit. Media reported in November 2019 that the project was only operating at partial capacity, pumping 20,000 m<sup>3</sup> /day, mainly due to a lack of electricity. Instead, the operating machineries consumed up to 1,000 litres of diesel per hour to operate the system and provide water for less than 20 per cent of the initial target population (Abiye, 2019). A newsletter from the French Ministry for the Economy and Finance about water and sanitation in Djibouti, of March 2021, said that due to the limited electricity supply, only 10,000 m<sup>3</sup>/day – 10 per cent of full capacity – were actually being imported.<sup>19</sup>

In Djibouti, the impact of the 2012 drought was felt in different ways, but the absence of mitigation measures specific to the energy sector worsened the crisis. Indeed, in urban areas, ONEAD was unable to meet the increased water demand due to the additional electricity requirements for pumping groundwater not being satisfied (World Bank, 2012). It seems that the electrification of the boreholes in the network was not yet finalized by August 2021, when a delegation from Djibouti visited the Ethiopian Minister of Finance and discussed the bilateral water supply project (Ministre du Budget, 2021).

However, when a UNICEF representative visited ONEAD’s water plant in Djibouti in September 2021, it was learnt that the electricity bills are often not paid either by

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<sup>17</sup> Inferred from [www.topographic-map.com](http://www.topographic-map.com) for Agar Region.

<sup>18</sup> The power purchase agreement between Djibouti and Ethiopia is on a ‘best-effort basis’, which means Ethiopia only exports electricity when the dams generate a surplus. This makes Djibouti vulnerable to climate change impacts on Ethiopian dams’ water levels.

<sup>19</sup> <https://www.tresor.economie.gouv.fr/Pays/DJ/l-eau-et-l-assainissement-a-djibouti-un-secteur-porteur-pour-les-entreprises-francaises>

the Djiboutian or the Ethiopian authorities, causing the main pipe which supplies water to Djibouti to be out of service. At that point in time, the city was only receiving around 15,000 m<sup>3</sup>/day from the EDTPW (Vadillo, personal communication).

It is not known if energy access was made part of the agreement between the parties, or what party foots the bill for pumping it from the Ethiopian aquifers.

## 2.2 Groundwater conditions

Ethiopia's geography is a mix of low-lying semi-arid regions mainly in the northeast and southeast, and wetter highlands mainly in the central and western regions. Seasonal precipitation patterns are highly variable, with some regions experiencing a single rainy season and others experiencing two or three wet periods within a given year.

The Somali regional state of Ethiopia, in the north-eastern part of the country, faces multiple challenges related to water supply. The region receives less rainfall than others in Ethiopia, has a complex hydrogeology, and is sparsely populated, mainly by people practicing agro-pastoralism and pastoralism. The quantity and distribution of water supply schemes are not sufficient to meet the demands. Groundwater availability here, including for the EDTWP area, generally ranges from about 50 to 600 metres below ground level, which results in unpredictability and high costs in extracting and pumping water. In addition, there is a lack of reliable data on groundwater availability and composition; more information is needed for targeting drilling sites and for designing and implementing groundwater-based water supply systems, most of which are state-managed and operated with no involvement of the local community or the private sector. Frequent breakdown of boreholes and pumps also contributes to water scarcity (UNICEF, 2020).

This portion of Ethiopia is characterized by increasingly erratic rainfall patterns, varying greatly in amount from year to year. There are four distinct seasons known in the region, their beginning and end varying from place to place and from year to year. The main rainy season, *gu*, is normally from late March up to early June. The mean annual rainfall here is estimated to be 465 mm (World Bank, 2020) whereas in the well-field surroundings it is estimated to be about 200–300 mm. The area is prone to both drought and flood as it sits at the juncture of the East African and Sahelian climate zones (Murgatroyd et al., 2021). These conditions place the population of the area among the most vulnerable in Ethiopia. In 2019, Oxfam estimated that the Somali Region endures near-constant severe drought. Communities are losing substantial parts of their livestock, the main source of livelihood for many, alongside crop failures. The drought is affecting almost all areas

similarly, so people are not able to move their animals from place to place in search of pasture and water (Hufstader, 2019). Additionally, there are recurring conflicts between communities in Somali and those in the neighbouring Afar regional state; contested territories are shown in maps recognized by the respective regions but differ from the official map provided by the federal Central Statistical Agency of Ethiopia.

Djibouti, a semi-desert state in the Horn of Africa with an arid climate, is also characterized by low and irregular rainfall (average of 140mm/year), resulting in continuous periods of drought. The climatic conditions and the absence of perennial surface water have progressively led to an intensive exploitation of groundwater to meet increasing water demands, with seawater intrusion constituting a significant risk of groundwater degradation (Razack et al., 2019). The water stress level is high since the country does not have a permanent source of surface water and most of the groundwater is saline, with large amounts of energy needed to desalinate and render it potable. Less than half of the population in the country had access to electricity in 2019, according to the World Bank.<sup>20</sup> Djibouti imports electricity from Ethiopia, up to 100 MW yearly, to cover a part of the country's total power demand.

### **2.2.1 The Shinile Plain and the Awash River Basin**

Much like the rest of Ethiopia, the Somali Region can be characterized as having a highly varying and complex hydrogeology that generally does not lend itself to major groundwater developments. Here, one mostly finds deep water tables, high salinity water, and low yielding aquifers. Notably, one area with better groundwater potential is the Shinile Plain, hosting one of the most prolific aquifer systems known in Ethiopia: the Shinile alluvium, or alluvio lacustrine sediments (Kebede, 2013; Kebede et al., 2021; UNICEF, 2020).

A groundwater potential assessment of the area initiated by the Ministry of Agriculture (MoA) and published in 2012 aimed at a quantitative and qualitative evaluation of the Shinile groundwater system and subsequent identification of well sites/fields where sufficient groundwater could be exploited without negatively affecting the environment. This would, in turn, facilitate addressing the water shortage and associated food insecurity problems in the region (Ministry of Agriculture, 2012).

Other assessments of the area have been made over the years, the latest published in 2018 and conducted by the Geological Survey of Ethiopia, the Czech Development Agency, and others to upgrade geologic maps (Ministry of Mines and Geological

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<sup>20</sup> <https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=ET>;  
<https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=DJ>.

Survey of Ethiopia, 2018). Apart from the lowlands of eastern Ethiopia, the study area included the Aysha horst in the east, which borders Djibouti. A remote sensing analysis that includes the Shinile Zone (administrative entity, today referred to as Sitti Zone) and the Shinile woreda by Ketema et al. (2016) states that the output of the overlay analysis has been verified with observations on the ground and from boreholes drilled in the area.

The Shinile Plain lies in the southern part of the Afar depression. Most parts of these lowlands are underlain by post-rift volcanic rocks and fluviolacustrine sediments. The area is also characterized by the south-east mountain chain, the escarpment in the southern margin, and the chartered City state of Dire Dawa in the south. The plateau receives relatively high precipitation compared to the escarpment and the lowland areas. The aquifer system is mainly confined.<sup>21</sup> Sparsely growing shrubs and bushes are the dominant vegetation types in this arid area. The main drainage system is defined by the Eastern Awash River sub-basin in the south-western part, the Danakil Basin in the northern part, and the Ayisha (or Ayesha) Basin in the north-eastern part; the latter has practically insignificant recharge. Though many surface water streams are generated from the highlands, none is perennial and almost all *wadis*<sup>22</sup> disappear into the alluvial deposit before reaching the Awash River. Several dry lakes occur in the north-western part of the Shinile Plain, showing the ongoing process of desertification in the area (Ministry of Mines & Geological Survey of Ethiopia, Ministry of Agriculture, 2012; 2018). The relative absence of surface water results in a greater dependence on the groundwater resources.

In general, to understand underground resources including aquifer management conditions, dynamic groundwater–surface water interactions should be considered. The geographical area in question is predominantly located within the Awash River basin. This covers a total area of 114,123 km<sup>2</sup> and includes five regional states, Afar, Amhara, Oromia, SNNP, and Somali, and two administrative city councils (Addis Ababa and Dire Dawa). The Somali Region’s administrative borders also constitute boundaries of the Eastern catchment planning area. The Awash River rises on the high plateau to the west of Addis Ababa and drains the central part of the Ethiopian Rift before terminating in the north of the country in Lake Abe (or Abbe, or Abhe), which crosses the border with Djibouti. The groundwater–surface water interactions in the basin and the hydrological characteristics are consistent with those observed in other semi-arid and arid basins: the river is predominantly losing and acts as a source of recharge rather than as a sink for groundwater discharge (Kebede et al., 2021). The Awash River, however, is located at a great distance from the EDTWP well-field.

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<sup>21</sup> A confined aquifer is saturated with water, with layers of impermeable material both above and below the aquifer. These cause it to be under pressure so that when the aquifer is penetrated by a well, the water will rise above the top of the aquifer. See overview at USGS <https://on.doi.gov/3ybddMh>.

<sup>22</sup> A *wadi* is a bed or valley of a stream that is usually dry except during the rainy season.

Transmissivity and specific yields in the Shinile alluvio lacustrine aquifers reach up to 700 m<sup>2</sup>/day and 3.2 l/s/minute, with higher transmissivity noted at the foothill of the mountains, north of Dire Dawa. The formation is an extensive and productive porous aquifer, covering approximately 50 per cent of the Afar floor, which consists of boulders, gravels, sand, clay layers, wadi gravels and sand and lacustrine sediments (Kebede, 2013).

The major challenge to groundwater utilization in some parts of the area is the salinity, which varies spatially following the drainage pattern. In the highlands and marginal grabens at the foothills of the highlands – where the well-field is located – the total dissolved solids (TDS) is less than 1000 mg/l. This increases northward until it reaches around 10,000 mg/l in the northern lowlands and central Afar depressions. In the south Ca, Mg and HCO<sub>3</sub> ions dominate the groundwater ionic composition. The salinity is mainly imparted from dissolution of crystalline rocks in the highlands and dissolution of evaporite lenses from lacustrine sediments in the lowlands (Kebede, 2013).

Generally, groundwater recharge in the Shinile region depends on the seasonality of precipitation, variation in geological cover, associated structures, and availability of surface water. Due to variable rainfall pattern in the region, it is possible, but has yet to be confirmed, that the renewable aquifers composed of volcanics and alluvials could suffer from water resources stress. Due to the dominance of arid and semi-arid climatic conditions along the borders of the adjacent countries, groundwater replenishment is possible only through sporadic recharge (Abiye, 2010).

The previous assessments point to there being limited recharge within the plains, subject to low rainfall and regional recharge sources, with dependence on supplementary recharge by baseflow assumed to be from elevated areas of the Ayesha horst and from the southern escarpment.

The Quaternary tectonics along the Ethiopia–Djibouti border play a substantial role in governing the occurrence and circulation of groundwater by increasing the permeability of the rocks and modifying the topography. Fractures form prominent features in the area by transferring groundwater through different local basins within different countries, and hence, inter-basin groundwater transfer is an active process (Abiye, 2010).

Ketema et al. (2016) have described the groundwater potential for the Shinile woreda as predominantly moderate to high or high, with good recharge potential. Wells drilled are found to be productive with some cases of artesian conditions. The authors note that the area receives significant regional recharge from the south and south-eastern highlands as influx to the thick alluvial deposits. However, limitations

have been inferred in the representation of the results at the north-eastern corner of the woreda where areas that are geomorphologically unsuitable for recharge (situated over a water divide where groundwater storage is not expected) have been mapped as potential zones. The study notes that this could be due to the influence of the existence of a highly permeable geological unit (scoria) in the locality; it could also be an indicator that some local areas within the domain of the groundwater potential zones need further verification and adjustment during detailed studies.

The Ministry of Agriculture (2012) warns of risks connected to drawdowns that could be caused at the plains. Though these might not cause immediate impact on the system (including on boreholes serving the Dire Dawa and Harar city water supply), it recommended that the issue be further explored and monitored in the future, to avoid long-term regional groundwater level drops and the decrease of artesian pressures. “Long-term balances and relationships with the Shinile plain groundwater system and characteristics of the artesian wells must be established for proper planning, development and management of the resource,” it concludes (p. 84).

The Africa Groundwater Atlas’ hydrogeological map of Ethiopia<sup>23</sup> describes the area mostly as volcanic, with unconsolidated areas.

### **2.2.2 The hydrogeology of the project area**

Though the flow of groundwater in the Shinile Plain is dominated by the south-eastern highlands controlling major groundwater recharges, with part of the groundwater flow direction toward the north-east, there could be possible variation of flow direction locally. In the general explorations of Shinile, it is inferred that in the Kullen Valley, the groundwater flow is towards the north–west, in the direction of the general decrease in topography (Ministry of Agriculture, 2012; Ministry of Mines and Geological Survey of Ethiopia, 2018)(see Map 1 and Figure 1). The recharge zones are not clearly identified, but should reach the mountains adjacent to Dire Dawa city (south and south-east of the Kullen Valley), and could extend as far as the eastern basaltic highlands of the Karamara (in Somali regional state) and Chinakesen mountain chains (in Oromia regional state, not far from the chartered City state Dire Dawa and the Harari regional state), and even eastwards to Somalia. This, however, can only be verified with further study. Likewise, it is neither possible to confirm nor disprove whether the Kullen Valley is connected with the AF059.

There is also an indication of recharge taking place from Somalia’s highlands in the east, as groundwater in this area is slightly mineralized, as opposed to the north-west direction where it progressively becomes enriched in salinity indicating mixing effect

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<sup>23</sup> <https://www2.bgs.ac.uk/groundwater/international/africaGwAtlas.html>.

with regional and/or deep groundwater of the Rift Valley system with high chemical load (Wakgari, personal communication).

Local recharge is expected to be very limited due to low local rainfall and very high evapotranspiration, and thick clay layers on top that hinder vertical recharge. It is possible that precipitation recharges part of the shallow aquifer (so-called inferoflux), which in turn recharges the deep volcano–sedimentary aquifers through geologic fractures (Awaleh et al., 2020, Awaleh, personal communication). The groundwater is under confined conditions with thick clay of an average of 25m overburden. Thus, groundwater is more artesian and/or the piezometric surface is very close to the surface (within 2–5 m below ground level) and there is no significant drawdown during pumping. Layers of clay in the sediments could hinder direct recharge. As mentioned, the volcanic highlands around the Kullen Valley have relatively high levels of precipitation. As also mentioned, many surface water streams are generated from the highlands but none is perennial, and almost all *wadis* disappear before reaching the Awash River.

Managed aquifer recharge (MAR) has been suggested to proactively prevent unsustainable over-abstraction (Wakgari, personal communication), but no study of the most suitable sites to construct structures to capture and divert rainwater into the aquifer system has been published.

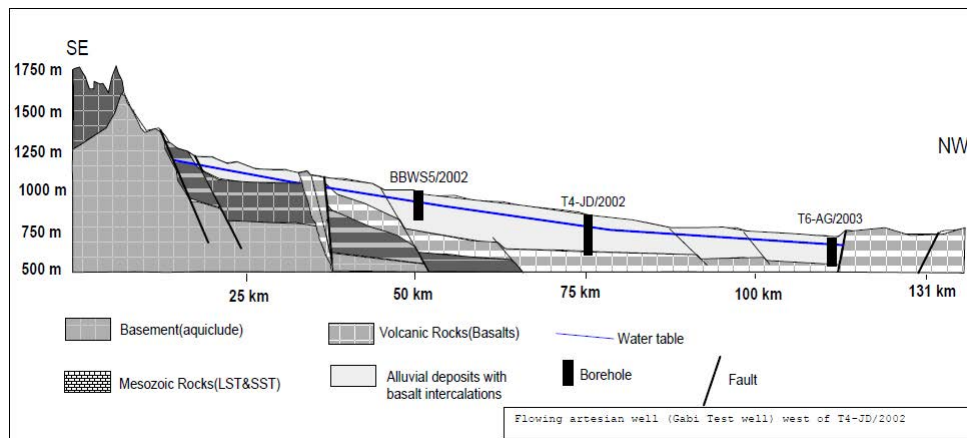


Figure 1. Hydrogeological section along Kullen Valley. From Ministry of Agriculture, 2012.



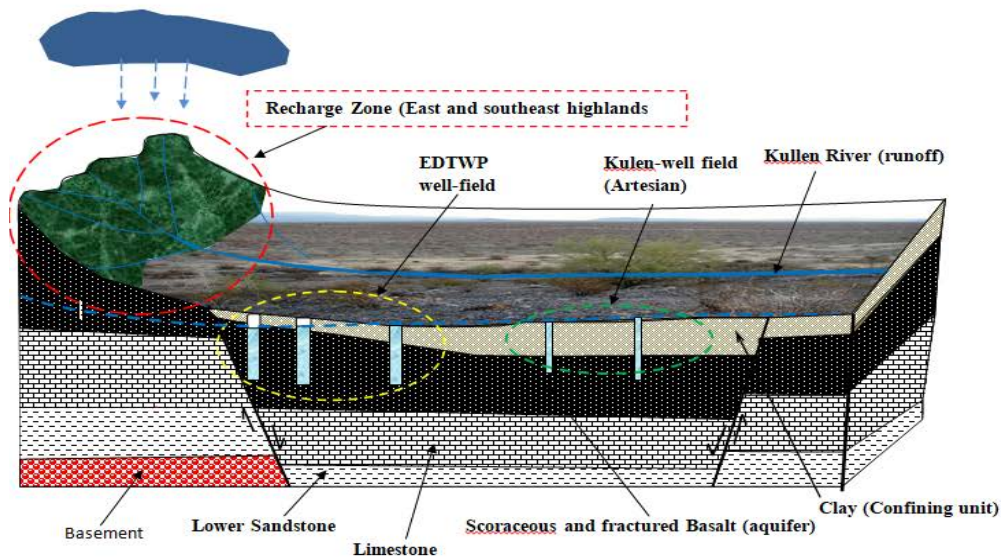


Figure 2. Hydrogeological conceptual model of the project area. From Wakgari, personal communication.

The physio-chemical water quality at the Kullen Valley is generally good but beyond it, towards the west and north-west, the quality deteriorates, and total dissolved solids (TDS) increases from about 400 mg/l in the Kullen Valley to about 2,000 mg/l, which is above the WHO standard for drinking water. Given that the recharge zones are not clearly known, they are also not protected to the degree that may be needed in the future to ensure the drinking water stays safe.

### 2.3 The transboundary aquifer (AF059)

The Information Sheet on the AF059, prepared as part of the TWAP (IGRAC and TWAP, 2015), contains data on the Afar Rift Valley / Afar Triangle Aquifer including a map. The map comes with disclaimers: that the boundary is [only] partially confirmed, and that the map is only provided for illustrative purposes (dimensions are only approximate). Further, the info sheet says that data is not available on freshwater abstractions within the aquifer area. According to IGRAC, there was very little data available for this aquifer, and obviously only a part of the aquifer was delineated for the TWAP exercise (Kukuric, personal communication).

The total area of this TBA is 51,000 km<sup>2</sup>, its main lithology is described as crystalline rocks (volcanics with some granites), and the aquifer type is categorized as multiple-layered, hydraulically connected, and mostly unconfined with some parts confined. The aquifer is further characterized by a low primary porosity but with secondary porosity (fractures). It is furthermore described as having high horizontal and vertical connectivity. According to the sheet, transmissivity values reported from Ethiopia are high with an average value of 1,800 m<sup>2</sup>/d. The mean average annual recharge is 195 Mm<sup>3</sup>/year. The area is subject to cyclical droughts and the annual average amount of recharge decreases to 43Mm<sup>3</sup>/year within Ethiopia.

### 3. Governance and management of groundwater in Ethiopia

The governance and management of the groundwater that the EDTWP sources and distributes in Djibouti are principally matters for the Ethiopian administration and actors at multiple levels. This section provides an overview of the country's applicable groundwater law and policy. Here, groundwater *governance* is referred to as steering processes involving institutions, actors, and capacity; a legal framework; and policy and planning (Groundwater Governance Project, 2016). Linton and Brooks (2011) note that good groundwater governance can best be met through appropriate scales of interest articulation and decision-making, and involvement of a broad range of non-state actors as well as formal agencies of the state.

Groundwater *management*, in contrast, focuses on practical implementation activities and the “nitty-gritty of day-to-day operations” that emphasize the results of decisions (Linton and Brooks, 2011). If governance concerns human-centred processes, the result of which establishes who gets water, when, how, and where, then resources management involves the practical activities relating to abstraction, preventing the degradation of groundwater quality, long-term sustainability protection, and a myriad of things in between. Compared with governance, management revolves around ‘hard’ matters: infrastructure and technology, tangible measures, interventions, actions, and activities that are undertaken on the ground to handle the resource and its surrounding environment, in which human and material resources are harnessed to achieve a known goal within a known institutional structure (Olsen, 2003; Pahl-Wostl, 2009).

#### 3.1 Institutions and actors

The defining feature of the 1995 Federal Democratic Republic of Ethiopia (FDRE) Constitution is its recognition of the nations, nationalities, and peoples as the basic building block (Mekuria Fikre and Tadesse, 2019). Ethno–linguistic identity and autonomy for the regional states are the foundation. With this comes pronounced multi-level governance features, which in the realm of water resources, to some extent, are influenced by the country's twelve major river basins. The division of powers and duties between the Federal level and the regional governments mirror the importance of protecting and coordinating the country's surface water use.

At the time of preparing and taking decisions on the project, the principal institutions for water were the Ministry of Water, Irrigation and Energy (MoWIE)(today restructured to the Ministry of Water and Energy) and the Basin

Development Authority (BDA).<sup>24</sup> These were in charge of the country's river basin management and of promoting integrated water resources management (IWRM) implementation. In parallel, Ethiopia has long had authorities or dedicated offices for three of its river basins, one of which was for the Awash River. From 2008 to 2018, administration of the basin took place under the *Awash Basin High Council and Authority* that was organized under the federal *River Basin High Council and Authorities*. The overall objective, as for the Abbay River and the Rift Valley Lakes River basins, was to promote and monitor the implementation of IWRM in an equitable and participatory manner and be accountable to the federal Council of Ministers. This mandate was placed with the federal Basin Development Authority during the years 2018–21.

At the time that the EDTWP appeared on the drawing table, the Awash River Basin Authority was also tasked to “[g]ive advice and technical support to the Basin High Council and the then Ministry of Water Resources *on dispute resolution* in relation to the allocation and use of *water resources* of the basin” and, “[o]n the basis of instructions of the Basin High Council, prepare and provide necessary information for the concerned body in charge of *negotiations* with other countries concerning trans-boundary *river basins*” (Regulation No. 156/2008, Art. 6 (2, 11)(emphasis added)). Despite those provisions, and the potentially arbitrary displacement of local people from the well-field area, the Basin Authority was not consulted when decisions on the project were made by the country's Executive.

The Constitution imposes on the government the duty to hold land and other natural resources on behalf of the people and to deploy them for their common benefit and development (Art. 89(5)). The right to administer land and other natural resources in accordance with federal laws is vested in the regional states (Art. 52(d) and 55(5)). Thereunder, the Somali Water Development Bureau and its Environmental Protection Agency have their respective responsibilities for issuing permits for water abstraction, emission discharges, and environmental impact assessments (EIAs) within the Somali regional state.

As noted above, when the supply agreement between the Governments of Ethiopia and Djibouti was ratified by the Ethiopian House of Representatives (Proclamation No. 856/2014), the Ethiopian Government appointed the Ministry of Finance and Economic Development as the empowered implementation body. Nothing suggests that the Ministry of Water was involved in any deliberations.

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<sup>24</sup> Following the general elections and formation of a new government in 2021, the former Ministry of Water, Energy and Irrigation (MoWIE) was split into two ministries: the Ministry of Water and Energy (MoWE), and the Ministry of Irrigation and Lowland Development. The Basin Development Authority, established in 2018, was dissolved with basin planning and coordination instead falling under the new MoWE.

Below the regional states are local agencies known as *woredas* (third-level administration districts, managed by a local government) within which are a number of *kebeles* (sub-districts) that represent the smallest unit of local government. The well-field lies in the Shinile *woreda*. These administrative bodies are generally left out of decisions of strategic importance, which was the case also for the EDTWP.

## 3.2 Legal framework

### 3.2.1 Applicable domestic law

The Ethiopian Water Resources Management Proclamation (No. 197/2000) requires that a permit is sought and granted to construct waterworks, which includes the drilling of boreholes, and for the supply and transfer of water (Art. 11(1)).

Implementation and enforcement authority for this proclamation is somewhat unclear concerning groundwater and aquifers, but points to the Somali regional state as the body being empowered to handle permit applications. In parallel, it seems that under the River Basin Councils and Authorities Proclamation (No. 534/2007), the Awash Basin Authority should also have had a mandate to issue and enforce permits.

Under the Environmental Impact Assessment Proclamation (No. 299/2002), Art. 14(1)), the equivalent of a Ministry of Environment – then referred to as the Environment Protection Agency (EPA)<sup>25</sup> – was responsible for evaluating and monitoring the implementation of EIAs for projects subject to licensing, execution or supervision *by a federal agency*, or when an EIA report shows likelihood of trans-regional impact. In all other cases, the regional environment regulatory body is responsible.

With regards to the EDTWP, while the Kullen aquifer is located in a transboundary river basin, it is likely that the aquifer is of trans-regional nature, as recharge zones may be located outside of Somali, in the adjacent regional states of Oromia and Harari, and the city-state Dire Dawa. Additionally, as the Ministry of Finance was appointed as the implementation agency, the duty to ensure that an EIA was conducted would fall on the federal EPA. However, as every sectoral governmental body has the delegated authority to make decisions on proponents' environmental impact statements (Abebe, 2012), the Ministry would have been empowered to evaluate such an assessment, had there been one.

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<sup>25</sup> Since 2002, the EPA has been renamed and restructured many times. After the general election in 2021, the Environment, Forest and Climate Change Commission was dissolved. At the time of writing, no final decision had been made on a new organizational setup.

Regardless, Mekonnen (2019) finds there to be a lack of preparation of project EIAs in Ethiopia generally, and in Somali in particular, due to inadequate capacities and resources at the federal as well as the regional levels. Hence, public consultation, which ought to be an integral part of all EIAs before consideration by decision makers, are generally not carried out as provided for by law. The EPA and the regional states' water authorities rarely coordinate before the implementation of projects, despite the regional EIA Proclamation stipulating that the public should not only be informed of such projects in a timely manner, but also that there should be a legal guarantee for effective notification.

### 3.2.2 Mandate situation under the Federal Ethiopian Constitution

The Federal level is empowered to enact laws regarding natural resources including water (FDRE Constitution Art. 51(5)), and to formulate and implement foreign policy as well as to negotiate and ratify international agreements (Art. 51(8)). It has clearly expressed powers to determine and administer utilization of transboundary rivers and lakes. However, constitutional authority regarding transboundary and transregional groundwaters is ambiguous. In light of that, the Constitution states that “all powers not expressly given to the Federal Government and the States are reserved to the States” (Art. 52). According to an unofficial translation,<sup>26</sup> the Constitution further provides that the Federal level shall “determine and administer the utilization of *rivers and lakes* which *link* two or more Regions or which are *transboundary*” (Art. 51(11) (emphasis added)). It is to be noted here that the official English language version of the Constitution translates Art. 51(11) to read “determine and administer the utilization of the *waters or* rivers and lakes linking two or more States or crossing the boundaries of the national territorial jurisdiction” (emphasis added where fundamentally different from the Amharic). According to this official translation, Art. 51 would imply through use of the words “*the waters or* rivers and lakes” (emphasis added) that the Federal level is mandated to take decisions relating to groundwater in aquifers that are shared between two or more nations or Regions. However, the Constitution states that the Amharic version, with its express reference only to “*rivers and lakes*” (emphasis added), shall have final legal authority over any interpretations into English (or other languages).

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<sup>26</sup> The official translation of the Constitution into English sits next to the Amharic version that was published in the Federal Negarit Gazeta. However, the official translations of certain Constitutional provisions (as well as other laws) are in some instances inconsistent with the Amharic version. The Constitution (Article 106) provides that “[t]he Amharic version of this Constitution shall have final legal authority”. Consequently, in situations such as this when the English translation does not correspond with the Amharic version, the Amharic version's specific reference to “*rivers and lakes*” would take precedence; groundwater would therefore not be covered.

For this report, translations of the relevant provisions have been done by three Ethiopians independently of each other, and compared with the official version.

Consequently, the regional states would be left to determine and administer the utilization of all *groundwater* resources, whether aquifers are transboundary, trans-regional, or located entirely inside their jurisdiction. The legal situation is further confounded by the previously applicable Proclamation (No. 4/1995), laying down definitions of powers and duties of the executive organs of the Federal Republic of Ethiopia. According to this proclamation, the erstwhile Ministry of Water Resources was to “[d]etermine conditions and methods required for the optimum allocation and utilization of *water* that flows across or lies between more than one *Regional Governments*” and “issue permits to construct and operate water works relating to [such] waters” (Art. 17(1, 3) (emphasis added)).<sup>27</sup> Here, only TBAs<sup>28</sup> are explicitly excluded from the scope of the provisions.

The semi-novel governance structure introduced with the BDA does not expressly comprise groundwater or aquifers. While the regulatory setup causes regulatory overlaps, it also results in matters that are sometimes orphaned when no institution seemingly has the authority over or responsibility for underground resources.

In the case of the EDTWP, it can be argued that while the Kullen well-field may or may not lie *outside* the AF059, according to the preliminary delineation, the well-field is entirely *inside* the Somali regional state. In such case, the regional Government of the area should have had the mandate to issue the groundwater abstraction permit. Even if it were known, or could have been assumed, that the well-field is indeed part of the AF059 TBA system, *and/or* is possibly recharged from Oromia, Harari and the Dire Dawa (thus, from outside the Somali regional state), the Constitution leaves the jurisdiction to the Somali regional state.

Nonetheless, the decisions regarding the EDTWP were taken at the federal level. This is possibly because the official translation of the Constitution into English, despite not being in accordance with the official Amharic wordings, has permanently swayed the understanding of the division of power between the federal level and the regional states. From a strategic and geopolitical perspective, it may have seemed natural to appoint the equivalent of the Chinese Ministry of Finance to handle the cross-border water transfer project.

### 3.3 Policy and planning measures

Transboundary waters feature in Ethiopia’s 1999 Water Resources Management Policy and the accompanying Water Sector Strategy of 2001. Among other things,

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<sup>27</sup> In the updated version of this Proclamation, No. 1097/2018, the powers and duties of the MoWIE cover “national *and transboundary water resources*”, Article 23(g) (emphasis added).

<sup>28</sup> For the definition of a TBA here, it seems suitable to turn to the lengthier formulation in the official English language version of the Constitution Article 51(11): “linking two or more States or crossing the boundaries of the national territorial jurisdiction”.

the Policy speaks of the need to “[f]oster meaningful and mutually fair regional cooperation and agreements on the joint and efficient use of transboundary waters with Riparian countries based on ‘equitable and reasonable’ use principles” and “[c]omply with those international covenants adopted” (Ministry of Water, 1999). The Strategy adds “[i]dentify common development projects that can be developed jointly with other riparian countries on equitable basis, paying special attention to Ethiopia’s interest” (Ministry of Water, 2001). However, most statements refer explicitly to transboundary *rivers*, making it unclear if TBAs were at all considered. While Ethiopia is party neither to the UNECE Water Convention nor to the UN Watercourses Convention, given that international cooperation is considered binding under both customary international law and the ICESCR, which has been signed and ratified by Ethiopia, its transboundary waters are to be managed accordingly.

In the revised Water Policy and Strategy,<sup>29</sup> transboundary “waters” are again referred to, with utilization of “shared water resources in an equitable and reasonable manner” expressly mentioned, alongside “basin institutions”. The words “transboundary rivers” are not used in the new version, indicating perhaps an intention to also cover TBAs. The reference to international covenants has also been dropped.

Though much less common than for surface water bodies, groundwater development and management plans (or similar types of planning instruments) can serve to translate wider policy statements into budgeted programmes of action. One of the more important, explicit tasks for the erstwhile Basin Authorities was to prepare basin management plans, and submit them to the Basin High Council. Of interest here is the Awash River basin. In its ‘Integrated watershed strategic plan’ of 2016, the Eastern Awash sub-basin including the desert plains and Shinile is very briefly described as having ‘increment’ population number, intensive farming practice and overgrazing that reduces the vegetation coverage; as a result, soil loss due to erosion is determined as high. It is recognized that “[s]ome community irrigation projects have been introduced and some are on the course of development using groundwater”; however, the EDTWP is not mentioned despite being midway through completion, and groundwater is not given attention elsewhere in this document.

Studies in 2016 were followed by an overall basin “Strategic Plan” in 2017. Herein, groundwater is referred to mainly by stating that “[s]o far, there has never been a comprehensive study that characterizes the ground water potential of the basin”, and that the lack of wastewater treatment impacts on shallow groundwater resources (Awash Basin Authority, 2017). The Plan set out to conduct a detailed study for

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<sup>29</sup> The MoWE presented a final draft of the Water Policy and Strategy to the Attorney General and the Prime Minister’s Office in August 2021. At the time of writing, the political situation in the country was such that no priority extended to the approval of the new Policy.

groundwater potential assessment [sic], and another for groundwater development, with the MoWIE and the regional water authority as action owners alongside the Basin Authority's own work.

No current work is undertaken by the Awash Basin Development Office to prepare plans for the BDA; representatives admit that the organizational capacity is not in place to do so.

The BDA released a countrywide Strategic Plan (2013–2022) in 2020. Among the activities planned for is to increase the groundwater information coverage from 17.95 to 35 per cent, and make the water resource available for development; develop a national groundwater map using hydrogeology and remote sensing techniques; and develop and implement groundwater policy and supporting legal frameworks for the development and protection of groundwater resources at the national level (MoWIE and Basins Development Authority, 2020).

In parallel, Ethiopia's One Wash National Programme (Phase II) lists groundwater mapping as a central activity and places emphasis on resilience. The Government notes that “[c]onsidering that Ethiopia is one of the countries with the highest vulnerability to droughts globally and considering the severe impact of El Niño and the [Indian Ocean Dipole] droughts to WASH services in recent years, the WASH sector must incorporate the concept of climate resilience more strongly”. This is exemplified with how “in Somali region during the dry season in 2017, 95 per cent of water points were dry, the majority of them shallow wells and rainwater harvesting systems (*birkats* and *hafir* dams). The lessons learned of three consecutive failed rains during the 2015-2017 period emphasize the need to identify more climate resilient technologies and approaches in areas affected by recurrent droughts” (Federal Democratic Republic of Ethiopia, 2018: 53).

In the case of the EDTWP and the AF059, while the scientific uncertainties are plentiful, the policy and planning dimensions are dismal. Ethiopia's river basin planning is generally under-capacitated with respect to groundwater and the Awash Basin Development Office (like the Basin Development Authority before it) does not consider the project part of its mandate, and perhaps rightly so. No joint custody arrangements for the AF059 are in place between the countries sharing it, nor is one in the pipeline. It is yet unclear if the federal level (the newly restructured MoWE) will want to take on transboundary groundwater issues to any greater degree than previous administrations have.



### 3.4 Well-field management and aquifer sustainability

For the EDTWP, management measures concern an aquifer /system/<sup>30</sup> a well-field consisting of 28 boreholes, as well as infrastructure connecting the groundwater reservoir to end-users in Djibouti, via a treatment plant serving the country's capital city. Well-field management generally involves regular monitoring of the aquifer, the water table, volume pumped, and areas of discharge and recharge along with neighbouring watersheds. It includes evaluation of the produced water quality, changes to the same, and balancing of needs and influence with conservation measures. Critically, it encompasses the boreholes, pumps, distribution pipes, and other physical equipment, being assets that require maintenance, evaluation, and planning as well as proactive measures.

A critical part of well-field management relates to data and information management: collection of and analysis of relevant data on yield, static and dynamic water level, energy consumption, etc. Well-field managers preferably use data in an operational decision support tool based on simple interpretation of the field observations (Alqadi et al., 2019). Here, though, it is unclear whether active, systematic monitoring of the groundwater potential takes place. It is also not known whether measures to manage the recharge zones are taken by the CGCOC Water Company, or to what extent ONEAD is regularly updated with information from the SCADA system supposedly in place, for instance on the water table in the Kullen Valley. The latter would be crucial for the water supply utility to judge the water security risks. No tentative conclusions can be drawn today regarding the impact on the local groundwater resource base and the water table caused by the abstraction. Similarly, it is unknown whether water stress is or has been experienced in recent years or if electricity access is the main bottleneck today.

Ethiopia suffers from limited access to detailed and updated hydrogeological data – much of it due to its diverse aquifer systems, vast landmass featuring a volcanic plateau tapering into a rift valley and peripheral lowlands, complex geological variations, and inaccessibility of lowland areas due to political insecurity (Godfrey and Hailemichael, 2016). Likewise, the complexity of Ethiopia's topography and climate poses a challenge to those working to identify historical climatic trends and future projections. In addition, the poor availability of meteorological observations hinders the effort to analyze droughts, as well as the role that climate change may play in such events (Philip et al., 2018).

Dedicated investments in building capacity to enable data generation and exchange, and thereby increase the sustainability of the groundwater system and water supply,

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<sup>30</sup> It is not known if the well-field taps a single aquifer or an aquifer system, defined as “a series of two or more aquifers that are hydraulically connected” according to the Draft Articles (UNGA, 2008), Art. 1(b).

are often missing. In the absence of such interests, the international community may want to assist. Besides capacity issues, groundwater resource assessment requires a willingness to share information, as well as to generate data in the first place. Both are often hampered by a lack of functioning databases and information management structures (Nijsten et al., 2018).

Groundwater managers must be particularly sensitive to the reality that rapidly falling water tables might not appear until some years after a serious overdraft begins, by which time it might be too late to do much about it. The precautionary principle, as well as the principle of sustainability, requires caution when setting allowable drawdowns or in assessing other risks to the sustainability of the aquifer or of the aquatic environment related to the aquifer (Dellapenna, 2011).

The population density is low in the Kullen Valley but higher in Dire Dawa and possibly also in other parts of the highlands where recharge takes place. Source water protection, such as drinking water protection zones, may be needed to ensure that the water quality remains good in the future. Alternatively, the operator may need to invest in treatment facilities. The need for MAR must also be explored and implemented with reciprocity aspects on the table, when several Ethiopian regions are involved – none of which gains directly from the abstraction of groundwater for distribution in another country.

It is not known whether the undisclosed agreements between the parties treat groundwater only as a resource to be developed and exploited, or if aquifer management, protection, and recharge measures are also covered. It has not been confirmed whether Ethiopia has actually given Djibouti a plot of land in Ethiopia, but the agreement may – and should – stipulate an exclusion zone within which no competing groundwater abstraction is permitted, to prevent tapping into the resources allocated for transfer. Another unanswered question relates to who pays the operating teams at the stations and the well-field management on the Ethiopian side.

## 4. International law on (ground)water cooperation

The cross-border water transfer that the EDTWP constitutes is a matter of international law – the rules of sovereign nations, which in the absence of a superior global authority is mainly enforced by treaty bodies set up for the purpose, and by the international community through so-called diplomatic dialogue tracks. The project is subject to the international legal system primarily if it involves a transboundary aquifer, the AF059 – but also, to some degree, if it does not. This section deliberates on how the three countries, bound by a multilateral agreement on water supply, also have obligations under international human rights law, and can take guidance from norms applicable to shared groundwater resources.

### 4.1 Duty to cooperate under international law

Different principles reflecting varying state practices on the uses of international rivers and lakes started to emerge late in the 19th century, one of those being that of absolute territorial sovereignty. However, the basic principles of contemporary international law rest on limited territorial sovereignty, asserting that every riparian state has a right to use the waters of the shared watercourse but is under a corresponding duty to ensure that such use does not harm other riparians. Thus, cooperation and peaceful resolution of disputes is called for (Salman, 2007). International law is a tool to achieve mutually beneficial relations that can be a driver for cooperation, which in turn rests on two key building-blocks: reciprocity and good faith. Apart from treaties and conventions that bind the parties to them, a growing body of customary law principles has emerged around the notion of cooperation: that is, the practices of states undertaken out of a sense of legal obligation, presumed to bind all states except those that can show they have consistently resisted (or objected to) the custom. Cooperative behaviour enables interdependence between states, stronger economic ties, and the governance of negative environmental effects of human activity, including their transboundary impact. Numerous treaties on international cooperation and joint action were adopted in the context of the 1992 UN Conference on Environment and Development in Rio, including the Framework Convention on Climate Change (Leb, 2015).<sup>31</sup>

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<sup>31</sup> The Rio Declaration contains several principles that are a reminder of this notion: “All States and all people shall cooperate in the essential task of eradicating poverty as an indispensable requirement for sustainable development [...]”; “States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem”; and “States should cooperate to strengthen endogenous capacity-building for sustainable development by improving scientific

The duty to cooperate – an obligation of states to peacefully settle disputes and resolve differences over shared resources – is central today to the protection of the global *environment* and considered a binding principle under customary international law (Dellapenna, 2001). While not initially identified as applicable to international *water* law, there is now increasing consensus on the topic and the codification of the duty to cooperate among the general principles of this body of law acknowledges this rule’s fundamental importance (Leb, 2013, 2015). The international law of water management developed from the 19<sup>th</sup> century onwards. Historically, the processes relating to *transboundary* freshwaters focused on surface waters, made necessary by industrialization and the growing claims over river flows between upper and lower riparian states (Dellapenna, 2011). In the practice of states, *groundwater* has been largely ‘out of sight and out of mind’. Likewise, albeit to a lesser extent, this is the case of the work of international organizations and expert groups. The resulting legal regime for groundwater is “rather crude and is in dire need of development given groundwater’s abundance and vulnerability relative to surface water” (McCaffrey, 2019: 544f).

Since 1972, most bi- and multilateral agreements require states to cooperate with respect to transboundary waters and to resolve water disputes peacefully, as codified by the International Law Association (ILA) in the 1966 Helsinki Rules on the Uses of the Waters of International Rivers (Conti and Gupta, 2016). While some scholars (see, for instance, Beyerlin, 2008) believe that ‘cooperation’ presents little more than a principle of international law from which obligations could be derived but is not a duty in and of itself, others argue that it does indeed represent a *legal* duty. The latter position has been firmly recognized in the 1997 *UN Convention on the Law of Non-Navigational Uses of International Watercourses* (Watercourses Convention) (Leb, 2015),<sup>32</sup> which came into force in 2014. Indeed, international water law is generally referred to as the law of cooperation. Salman (2021) notes how the Watercourses Convention mentions the word “cooperate” and its derivatives fifteen times, and affirms in its preamble the importance of international cooperation and good-neighbourliness in this field.

The Watercourses Convention only binds the states that have signed and ratified it, and furthermore, applies only to aquifers with a hydraulic relation to surface water bodies. It therefore excludes aquifers such as the AF059. Yet, the prominent place that cooperation has in this treaty speaks of the role that this concept plays today. That cooperation over transboundary waters is considered customary law, and thereby supports applying a similar approach to shared groundwater resources.

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understanding through exchanges of scientific and technological knowledge [...]” (Principles 5, 7, and 9, respectively).

<sup>32</sup> The Preamble to the Watercourses Convention (para. 4) explicitly states that it is an embodiment not only of the progressive development of international water law but also of the codification of existing customary rules.

The duty of cooperation under customary international law has also been codified in several other instruments of relevance to TBAs (see further on in sub-section 4.2): in the 1966 *Helsinki Rules on the Uses of the Waters of International Rivers*; the 1992 *UNECE Water Convention on the Protection and Use of Transboundary Watercourses and International Lakes* (UNECE Water Convention); the 2004 *Berlin Rules on Water Resources*; the *Draft Articles on the Law of Transboundary Aquifers* (Draft Articles) of 2008; and in the 2012 *Model Provisions on Transboundary Groundwater*. Of these, only the UNECE Water Convention is binding on its Parties (which currently numbers 45).

#### 4.1.1 The content of the duty to cooperate

The general duty to cooperate provides a normative umbrella for action in the transboundary context, in accordance with the interests of riparian and aquifer states: through compliance with customary international obligations that arise from the general duty, and through engagements in negotiations, consultations, planning, and joint management. The establishment of, and co-working in, institutions form another example of how the abstract obligation to cooperate is operationalized (Leb, 2013).

The line between substantive and procedural rules is blurred in international water law. For instance, in the context of planned measures, the obligation to notify and the act of notification are intertwined. This becomes clear with respect to the obligation to carry out an EIA where there is a risk of significant transboundary impact (in particular, on a shared resource), in which procedural elements exist alongside inherent substantive goals of due diligence measures and other content-related duties (Leb, 2013). In the International Court of Justice's 2010 judgment in the *Pulp Mills on the River Uruguay* case,<sup>33</sup> the court treats EIAs as a distinct and freestanding transboundary obligation in international law – reflecting Art. 17 of the Rio Declaration on Environment and Development, the 1991 *Espoo Convention on Transboundary Environmental Impact Assessments*, and Art. 7 the 2001 *ILC Draft Articles on Prevention of Transboundary Harm from Hazardous Activities*. Boyle (2010) notes that neither the Espoo Convention nor the UNEP EIA guidelines require assessment of alternative sites, and that it is for each party to determine on a case-by-case basis what is required, “having regard to the nature and magnitude of the proposed development and its likely adverse impact” (para 205).

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<sup>33</sup> The court found that the Statute should be interpreted “in accordance with a practice, which in recent years has gained so much acceptance among states that it may now be taken as a requirement under general international law to undertake an environmental impact assessment where there is a risk that the proposed industrial activity may have a significant adverse impact in a transboundary context...” (para 204).

Two generally well-regulated legal principles in international water law are the precautionary principle and prevention of damage by pollution. Closely connected is the duty to notify ahead of planned interventions or in connection with natural disasters, which involves aspects of timing, addressee, and other formalities as well as content. Additional examples of what cooperation entails include two-way communication, dialogue, consultation, and negotiation between and among concerned countries and parties. Notably, the right to participate in negotiations is regulated in the Watercourses Convention but not in the Draft Articles (Leb, 2013).

The lack of full understanding or awareness of the characteristics and extent of groundwater, as well as the rather embryonic nature of the law in this area – in part a consequence of the first factor – and the reality that TBAs are transboundary, gives rise to a ‘negative synergy’. This means that without some form of cooperative arrangement, such groundwater resources could be subject to two or more different domestic regulatory regimes (McCaffrey, 2019). In fact, application of well-established rules of customary international law to groundwater is more problematic than the application of those rules to surface waters because of the uncertain knowledge of the hydro-geologic characteristics of the resource. Acquiring knowledge is possible, but it is expensive and time-consuming. Because of such information problems, we often can only make tentative decisions regarding groundwater – decisions that the informal processes of customary regimes are ill adapted to revise or supplement in response to new data and information (Dellapenna, 2011).

Data, information, and knowledge on the local groundwater systems and their context are indispensable for effective groundwater resources management and ‘good’ governance (van der Gun, 2018). The uncertainty and vast data gaps that characterize groundwater and aquifers in general have profound implications on TBAs. Communicating and disseminating information is likewise critical. Hence, the question of whether those matters are covered by the understanding of [the principle of] ‘cooperation’ is critical. Nonetheless, different positions in the interpretation of whether this principle has yet crystallized into customary international law, and diverging doctrines on national sovereignty in the context of the law of transboundary aquifers, lead to diverse takes on the matter of information exchange.

Conti and Gupta (2016) point to how most agreements and codifications in the field since 1977 call on riparian/aquifer states to exchange relevant water information and data. This is, for instance, codified in the UNECE Water Convention (Art. 11). The authors further refer to how McCaffrey (1987, in Conti and Gupta, 2016) sees principles of cooperation, peaceful resolution of disputes and information exchange as customary law. Farrajota (2009) argues that the principle of cooperation is manifested primarily through specific procedural rules, i.e., formal rules of communication between states. These range from a

minimal direct exchange of fundamental data and information to the establishment of joint development commissions or other institutional mechanisms. Increasingly, hydrological data is gathered with the help of non-governmental organizations; even through participation of citizens whose contextualized concerns have directed the attention of governments to water problems as they are perceived on the ground.

Others take a more cautious approach, stressing that the obligation to regularly exchange data and information and the corollary duty to monitor and, where possible, generate additional data, as well as the obligation of prior notification of planned activities, cannot yet be regarded as binding. The principle is articulated in too few TBA agreements and arrangements to amount to customary international law at this point (Eckstein, 2017; Sindico, 2020).<sup>34</sup>

#### **4.1.2 Duty of cooperation under international human rights law**

The duty to cooperate is laid down in international human rights law, where it has had a firm place since the 1945 UN Charter stated that the purposes of the UN include “[t]o achieve international co-operation in solving international problems of an economic, social, cultural, or humanitarian character...” (Art. 1). The notion features most prominently in the 1966 International Covenant on Economic, Social and Cultural Rights (ICESCR) (Art. 2, 11, 23), with cooperative conduct being a selected pathway of implementation, inextricably linked to the concept of progressive realization that is at the heart of the ICESCR (Salman and McInerney-Lankford, 2004).

In addition, General Comment No. 15 on the right to water was adopted by the UN Committee on Economic Social and Cultural Rights in 2002. Providing authoritative interpretations<sup>35</sup> of the ICESCR and other treaties and relevant documents, the Committee called attention to the essential role of international cooperation and assistance through joint and separate action to achieve the full realization of the right to [drinking] water. The General Comment also points to how respect that should be shown to other countries mirrors duties imposed on parties to the Watercourses Convention (in Art. 5, 7), requiring equitable utilization of watercourses and the taking of measures to prevent significant harm being caused (para. 30–31).

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<sup>34</sup> Eckstein (personal communication) suggests that while the content of all of the existing formal/official arrangements found in treaties or treaty-like agreements, and informal/unofficial/unenforceable arrangements for TBAs around the world does seem to include and support the principle of data exchange, there are only seven formal and six informal arrangements in place. Such numbers do not support the conclusion that it can be regarded customary state practice based on *opinio juris*.

<sup>35</sup> The Committee’s General Comments are regularly referred to as non-binding soft law.

While General Comment No. 15 in itself does not contribute much to the understanding of obligations of riparian and TBA states vis-à-vis each other, it nevertheless has a value in highlighting how these principles of international water law are also part of the overall concept of the human right to water (Salman and McInerney-Lankford, 2004).

Cooperation is also alluded to in Resolution No. 300 on the Right to Water Obligations of 2015,<sup>36</sup> and the Guidelines on the Right to Water in Africa (2019), both adopted by the African Commission on Human and Peoples' Rights (ACHPR). Resolution No. 300, recalling the principle of cooperation with other bordering states under international law on fresh water, urges African Union Member states to meet their obligations in providing clean drinking water for all of their populations and to conscientiously cooperate in the management and protection of their freshwater resources. In parallel, the African Guidelines on the Right to Water – a non-binding soft law instrument – recall the African Union Convention On Cross-Border Cooperation, which has not been signed by either Ethiopia or Djibouti. They also list the customary principles of international water law guiding shared watercourses management, including the principles of reasonable and equitable use of shared water resources, no-harm, and cooperation as the basis for a sustainable management of transboundary water resources.

Ethiopia ratified the ICESCR in 1993 and has thereby agreed to be bound by it; similarly, China ratified it in 2001 while Djibouti's accession took place in 2002. Being a party to the Covenant involves the obligation to progressively realize established human rights and apply human rights principles to existing rules, roles, and responsibilities in government. The international human rights framework is accompanied by the African Charter on Human and Peoples' Rights (the Banjul Charter).

The human rights to water and sanitation (HRWS) were recognized in 2010 (Human Rights Council, 2010),<sup>37</sup> and regarded as derived from the rights to an adequate standard of living and to the highest attainable standard of health as provided in articles 11 and 12 of the ICESCR. The right to water underpins the 2030 Agenda target to achieve universal and equitable access to safe and affordable drinking water for all by 2030 (SDG 6.1).

In October 2021, the Human Rights Council recognized that having a safe, clean, healthy, and sustainable environment is a human right (R2HE) (Human Rights Council, 2021). Though the resolution is not legally binding, and the

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<sup>36</sup> <https://www.achpr.org/sessions/resolutions?id=149>.

<sup>37</sup> In 2010, water and sanitation were regarded parts of one and the same right. With the adoption of Resolution A/C.3/70/L.55/Rev.1 in 2015 the UN General Assembly formally recognized that these are two distinct rights.



right is far from established in customary international law, it serves to complement the HRWS – which can be seen as predominantly covering the provision of water and sanitation for domestic purposes – by allowing for a wider consideration of water resources protection at a systems level.

Additional water-related rights are potentially at stake in connection with the EDTWP. These are foremost the right to access water resources for food among subsistence farmers and indigenous peoples (“[i]n no case may a people be deprived of its own means of subsistence”, ICESCR Art. 1(2)), and the rights to life, livelihoods, adequate health, and an adequate standard of living.

Box 1. The human rights to water, sanitation, and a safe, clean, healthy, and sustainable environment.

International human rights law is enshrined in treaties and binding on State Parties and their proxies all the way through multi-level governance arrangements. An elaborate international machinery is set up for their implementation. According to ICESCR, Art. 2(1), UN State Parties “undertake to take steps, individually and through international assistance and co-operation, especially economic and technical, to the maximum of *its available* resources” (emphasis added). The wordings of the provision indicate that obligations are common but differentiated, distinguishing states in a position to assist from those that require international assistance and cooperation to realize the rights.

Thus, it follows that for some states – *developed* ones, in the following interchangeably referred to as donor countries<sup>38</sup> – there may be duties to extend cooperation assistance beyond their own territory. This is contested as – from a strictly legal viewpoint<sup>39</sup> – realization of the economic, social, and cultural (ESC) rights do not have extraterritorial reach; states’ obligations can be regarded as constrained by national borders (Coomans, 2011; Langford et al., 2012b). In comparison, the International Covenant on Civil and Political Rights and other conventions clearly limit at least some of their protections to individuals subject to or

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<sup>38</sup> Official development assistance (ODA) is defined by the OECD Development Assistance Committee (DAC) as government aid that promotes and specifically targets the economic development and welfare of developing countries. The DAC adopted ODA as the ‘gold standard’ of foreign aid in 1969 and it remains the main source of financing for development aid.  
<https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/official-development-assistance.htm>.

<sup>39</sup> Indeed, it has been dubbed “a generally perplexing question” whether treaties covering ESC rights have legally binding extraterritorial obligations. Langford et al. (2012a) note that many Northern States (including the USA and Sweden) have been clear that the answer should be in the negative; they do not give rise to obligations or entitlements, nor would they diminish the responsibilities of national governments to their citizens. International cooperation and assistance would rather be carried out of from a sense of solidarity and a moral obligation. The authors nonetheless suggest that there is an emerging consensus about the customary law nature of, at least, a negative extraterritorial obligation of all States to respect ESC rights.

within the jurisdiction of the state (Kanalán, 2018). Nonetheless, the normative calls for an expanded view on the application of the ESC rights are noticeable. Among others, Coomans (2011) summarizes how the UN Committee on ESC Rights has indicated that the ICESCR may have an effect beyond the borders of states Parties, meaning that states may be bound by their obligations under the treaty when acting extraterritorially. The extraterritorial positive obligations to contribute directly and financially to the realization of ESC rights can be justified as a moral duty to alleviate human suffering and eliminate worldwide poverty. The *Maastricht Principles on Extraterritorial Obligations of states in the area of Economic, Social and Cultural Rights*, a soft law interpretation of existing international law adopted by 40 experts in the field, advocate that states must elaborate, interpret, and apply relevant international agreements and standards in a manner consistent with their human rights obligations (de Schutter et al., 2012). The former UN Special Rapporteur on Human Rights and the Environment, John Knox, discusses transboundary environmental harm and raises the question of whether states have obligations to protect human rights against the extraterritorial environmental effects of actions taken within their territory. He finds that “[a]lthough work remains to be done to clarify the content of extraterritorial human rights obligations pertaining to the environment, the lack of complete clarity should not obscure a basic point: states have an obligation of international cooperation with respect to human rights” (OHCHR, 2013, para. 67).

If international cooperation is critical for realizing human rights, the content of the obligations and its relevance for TBAs remains to be framed. The jurisprudence on the obligations pertaining to the human right to water is still evolving and tends to show a degree of vagueness, especially in relation to the rights of residents of other states (Bulto, 2013). The same applies with respect to the recently recognized right to a healthy environment and how water pollution and diminution of water resources may interfere with the effective enjoyment of this and other human rights. A relevant question is also posed by Raible (2020): if development cooperation is a human rights issue, who is the holder of the human right and who is the bearer of the corresponding obligation? The ICESCR does not provide any guidance. Some of the implications of the rather elusive wordings and normative content of the ICESCR Art. 2(1) have been interpreted by the Committee on ESC Rights (Human Rights Council, 2014) and Sepúlveda (2006).

In the following, the obligations of developed State Parties (donor countries) are divided along with the well-known ‘tripartite typology’ of the duties, to respect, protect, and fulfil, where the latter is in turn divided into the sub-categories of facilitate, provide, and promote:

1. The duty to *respect* is a negative obligation that implies a requirement of UN State Parties to abstain from activities or measures with direct or indirect negative

impact on the enjoyment of rights outside the own territory.<sup>40</sup> The obligation reflects the ‘do no harm’ principle (Khalfan, 2017).

For instance, a state must not deprive another of the ability to realize the right to water for persons in its jurisdiction (UN Committee on Economic Social and Cultural Rights, 2002 (hereafter: General Comment No. 15), para. 31). This also applies to the case when a shared river or aquifer, which a co-riparian or aquifer state depends on for the realization of the right to water, is polluted or over-utilized by another state. Each co-riparian or aquifer state is to be viewed as a duty-bearer, albeit to varying degrees, in implementing the right (Bulto, 2013);

2. To *protect* rights-holders’ entitlements and freedoms, the state must ensure that non-state actors (third parties – mainly private sector companies<sup>41</sup> but also individuals) do not abuse the rights of others elsewhere. It is imperative to regulate activities that produce direct or indirect effects across borders, as well as those that risk doing so. The obligation to protect also requires states Parties to ensure the enjoyment of rights extraterritorially when negotiating, adopting, and ratifying international, multilateral, and bilateral agreements (General Comment 15, para. 35). The Maastricht Principles point to how states’ obligations include those pertaining to international investment deals (para. 17) (de Schutter et al., 2012).

Similar to the right to the highest attainable standard of health, the right to water entails steps to prevent citizens and companies within their own jurisdiction from violating the rights of individuals and communities in other countries (General Comment 15, para. 39). States are expected to take an active role to assist and cooperate with other states to this end;

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<sup>40</sup> Under international human rights law, the State has an obligation of negative nature: to respect existing water arrangements. There is also a similar duty not to undermine subsistence farmers and indigenous peoples’ existing access to food or other resources needed to provide for oneself, including access to water used for irrigation and precipitation for aquifer recharge (“In no case may a people be deprived of its own means of subsistence”, ICESCR, Art 1.2). This should also be interpreted so that it includes water needed for cattle. Rights-holders have a fundamental, correlating claim to maintain access to existing water supplies necessary for the enjoyment of their right. This includes *freedom from* intrusion; interruption; and disturbance, and requires States to refrain from interfering, directly or indirectly, with existing access. The State must especially respect traditional and customary arrangements, such as wells and boreholes for water allocation, that rural communities rely on.

<sup>41</sup> Though no binding obligations fall on the private sector, there are growing expectations that corporations act with due diligence, under a ‘responsibility to respect’ the established international human rights. Among the expectations is that companies know and show that they respect human rights – for instance that their activities do not risk abusing the human right to water for the local population – and have the necessary due diligence policies and processes in place. In 2011 the Human Rights Council unanimously adopted the so-called Ruggie Principles through Resolution 17/4, *Human rights and transnational corporations and other business enterprises*, and later also the UN Guiding Principles on Business and Human Rights, [http://www.ohchr.org/Documents/Issues/Business/A-HRC-17-31\\_AEV.pdf](http://www.ohchr.org/Documents/Issues/Business/A-HRC-17-31_AEV.pdf). The European Parliament approved a resolution on 10 March 2021 that includes recommendations to the European Union’s Commission to adopt a Directive on mandatory human rights due diligence for companies. This has been welcomed by the Office of the UN High Commissioner for Human Rights, OHCHR <https://www.ohchr.org/Documents/Issues/Business/ohchr-recommendations-to-ec-on-mhrdd.pdf>.

3. The obligation to *fulfil* (to facilitate, provide, and promote) is, perhaps, the one with the strongest implications on international cooperation:

(a) To *facilitate* cooperation, Sepúlveda (2006) notes that countries should structure their official development assistance (ODA) so that it takes due account of vulnerable groups, and the environment. Here, SDG targets 6.a.1 and 17.2 contain commitments by the international community to set aside ODA, regularly measured through agreed-upon indicators.<sup>42</sup> According to Raible (2020), the Committee has addressed the extraterritoriality of the ICESCR by calling on developed states Parties to assign 0.7 per cent of their Gross National Income (GNI) to development cooperation.<sup>43</sup>

(b) A duty to *provide* development assistance would generally arise in case of disaster and humanitarian crisis when countries are unable, for reasons beyond their control, to realize the enjoyment of human rights themselves by the means at their disposal (Sepúlveda, *ibid*). Since many countries lack the capacity to at all times provide – as in distribute as a service – water for their populations, McCaffrey (1992) argues that the international community must take a proactive approach to prevent foreseeable problems and to deal with natural disasters such as droughts. Precisely what this would entail is, however, unclear.

The duty to provide is furthermore limited in the context of the human rights to water and to water resources protection.<sup>44</sup> This becomes particularly clear from the following scenario: aquifer state A's use of groundwater in its territory to fulfil the right to water might diminish the amount of groundwater available in aquifer state B. The same holds true of the effects of pollution in state A, if aquifer recharge zones are located there and result in negative impacts in state B. Does state A have the duty to fulfil/provide the content of rights of foreign nationals, located in state B, with which it shares a water resource? The answer must be negative. Bourquain (2008: 197) argues that “[t]he rule that asks for joint action and international cooperation in order to realise the human rights in the Covenant – in particular Art. 2(1) and 11(2) ICESCR – only imposes very general and unspecified obligations upon the parties. They are therefore not appropriate for deriving concrete duties like the *delivery* of water” (emphasis added). Alston and Quinn comment that the commitment to international cooperation cannot accurately be “characterized as a legally binding obligation upon any particular state *to provide any particular form* of assistance” (Alston and

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<sup>42</sup> See, for instance, <https://www.sdg6data.org/indicator/6.a.1> and <https://unstats.un.org/sdgs/metadata/?Text=&Goal=17&Target=17.2>.

<sup>43</sup> Raible (2020) notes that the Committee has not explicitly referred to the setting aside of a part of the GNI to official development assistance as an ‘obligation’.

<sup>44</sup> See Grönwall and Danert, 2020, for elaboration of arguments on the limit to the duty to fulfil (provide).

Quinn, 1987: 191) (emphasis added). Bulto summarizes: “Inasmuch as the normative basis and scope of the state’s duty to fulfil remains vague, the protection afforded the human right to water in shared river basins leaves much to be desired” (2013: 177). By analogy, an aquifer state would not be obliged to distribute water extraterritorially under the duty to fulfil the human right to drinking water.

(c) With respect to international cooperation and the duty to *promote* human rights, this requires that technical and other assistance programmes, in part, aim to increase the awareness of human rights in the recipient country as well as empower people to identify and claim their rights (Sepúlveda, 2006). In terms of water resources, the fact that the 2030 Agenda contains goals dedicated to water (SDG 6 and 14) speaks of the international community’s commitment to this resource on a global scale (see next section).

In practice, the (whole of the) duty to *fulfil* is often articulated and realized by means of international organizations through which support for the right to water is met primarily through financial means – that is, by funds and aid to the international water sector. Langford et al. (2012a) point to how individual countries’ commitments offer an interpretation of the obligations relating to international cooperation. The authors recall that in 2006, the Committee on ESC Rights had yet to develop the precise general content of the obligation to ‘fulfil’ international cooperation at the international level. A decade later (2016), the Special Rapporteur on the right to water discussed development cooperation in the water and sanitation sector, assessing the roles that it can and should play. In his report, the term ‘cooperation’ was used to denote a horizontal relationship between funders and recipient states, noting that, conventionally, development cooperation includes actions such as grants, loans, debt forgiveness, technical and programming support, and policy advice to recipient states.

The substantive right to an adequate standard of living, under which the UN has recognized the rights to drinking water and sanitation, is to be ensured in part through international cooperation “based on free consent” (ICESCR, Art 11(1)). In addition, Art. 23 states that “[i]nternational action for the achievement of the rights [...] includes such methods as the conclusion of conventions, the adoption of recommendations, the furnishing of technical assistance and the holding of regional meetings and technical meetings for the purpose of consultation and study organized in conjunction with the Governments concerned”. In turn, technical assistance is a critical component of UN agencies’ programmes supporting states in their efforts. It is, among other things, provided by local or international specialists and partnerships with entities on the ground, through practical advisory services for the building of national and regional human rights infrastructures. It can encompass skills training

and transmission of working knowledge, aiming to maximize the quality of project implementation and impact.

For states *receiving* international assistance, there are other obligations following from the duty to cooperate. One is to identify needs for assistance in country reports to the UN. Another is to seek the assistance necessary to make up for lack of resources for the full realization of human rights; this can be requested from UN agencies, such as UN-Water, UNESCO, UNICEF, and WHO, and from inter-governmental and non-governmental organizations such as WaterAid, and international financial institutions such as the World Bank and the African Development Bank. Further, developing countries would be required to refrain from obstructing international organizations in their legitimate efforts to assist on the ground, and give priority to the needs of the most vulnerable (Sepúlveda, 2006).

The African Commission has long adjudicated issues involving the extraterritorial reach of states' human rights obligations (Bulto, 2013). In the context of the African Charter, and similarly to what applies to donor countries, it is asserted that each State Party to a human rights treaty assumes international responsibility solely towards its own inhabitants. A state does not assume an obligation to assist another state to *fulfil* the latter's obligations to ensure the realization of the rights of its inhabitants; the existing literature is in agreement that a state cannot be held responsible for not realizing the human rights of non-national non-residents<sup>45</sup> (Anyangwe, 1998; Bulto, 2013).

All states have core obligations that are of immediate effect. Among those is the requirement to comply with the cross-cutting human rights standards that form a basis of the human rights-based approach – principles emphasizing good governance including participation, accountability and transparency, non-discrimination, and the rule of law. Furthermore, in the 'Common Understanding' of this approach, adopted among UN agencies (UN Development Group, 2003), it was agreed that all programmes of development cooperation, policies and technical assistance should further the realization of human rights. Whereas there are challenges in nailing down the scope of the minimum core obligation of international *cooperation*, Langford et al. (2012a) draw attention to General Comment No. 14 on the right to health, wherein the Committee states that “[p]riority in the provision of international medical aid, distribution and management of resources, such as safe and potable water, food and medical supplies, and financial aid should be given to *the most vulnerable or marginalized* groups of the population” (UN Committee on Economic Social and Cultural Rights, 2000, para. 40) (emphasis added).

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<sup>45</sup> This refers to people who are not residing in the State in question. Regardless of citizenship, governments “shall take progressive measures to the extent of their available resources to protect the rights of everyone” in the case of rights to an adequate standard of living and other economic, social and cultural rights, OHCHR, 2006.

Similarly, while the African Guidelines on the Right to Water assert that states shall under no circumstances waive their sovereignty over natural resources, they also instruct that “[w]hen entering into international and regional engagements or undertaking bilateral and multilateral assistance, states must ensure that the right to water is *respected* and that those without basic access are *given priority*” (Para. 36.1) (emphasis added).

Summing up, developed nations /donor countries have a degree of human rights obligations to less-developed states, as well as to individuals outside of their borders. These primarily involve duties such as: to respect other countries’ water resources; to protect against extraterritorial abuse of human rights by third parties within their own jurisdiction; to facilitate cooperation through ODA and technical assistance programmes; and to promote cooperation, such as is done through the SDGs. Additionally, developed states may need to provide development assistance more directly in case of natural disasters, and take a proactive approach to prevent droughts. It is, however, uncertain what the latter duty entails.

#### **4.1.3 Cooperation on the Sustainable Development Goals**

Transboundary cooperation is also recognized in global policy and international commitments. SDG 6, agreed upon by the international community as part of the 2030 Agenda, concerns ensuring the availability and sustainable management of water and sanitation for all. It includes target 5: *By 2030, implement IWRM at all levels, including through transboundary cooperation as appropriate*, accompanied by an indicator (6.5.2) dedicated to quantifying transboundary water cooperation. Cooperation over these waters offers multiple benefits and contributes to many other SDGs, including those related to poverty alleviation, food security, health and well-being, clean energy, climate change, ecosystem protection, as well as peace and security, as stressed by the target’s custodian, UN-Water. Alongside SDG 6.5 there is also Target 6.a: *By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies*. ‘Cooperation’ here refers to aid in the form of grants and loans, including ODA, while capacity-building includes strengthening the skills, competencies and abilities in developing countries with regard to water governance and management.<sup>46</sup> This target implements the cooperation and technical assistance stipulated by human rights law.

Similarly, applicable to the African continent, Agenda 2063 aspires to “[a]n integrated continent politically united and based on the ideals of Pan-Africanism”, with ‘infrastructure connectivity’ being a priority, alongside goals for good

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<sup>46</sup> <https://www.sdg6monitoring.org/indicators/target-6a/>.

governance, democracy, respect for human rights, justice and the rule of law. These goals mirror SDGs 9 and 16. However, Agenda 2063 does not specifically mention IWRM and transboundary cooperation.

## 4.2 International law on transboundary groundwater and aquifers

International water law and customary norms on the subject of TBAs are hitherto far from widely accepted in terms of state practice and *opinio juris*. Hence, there are few legally binding regulatory standards on governance and management, allocation, and protection. Two treaties – the 1997 UN Watercourses Convention and the 1992 UNECE Convention – contain substantive as well as procedural obligations on surface water, but are limited in scope vis-à-vis TBAs. In the absence of a universal treaty regulating the uses and protection of such resources, customary international law, non-binding rules, and emerging law are of relevance.

The 1966 Helsinki Rules constitute guidelines regulating how rivers and their connected groundwaters that cross national boundaries may be used. Notwithstanding their lack of formal status, the Rules are considered authoritative and are widely quoted, in particular as they established the principle of “reasonable and equitable utilization” of the waters of an international drainage basin among riparian states as the basic principle of international water law. The Rules are also widely accepted as representing customary international law. As such, they have had major influence on subsequent developments on international water law. The Helsinki Rules cover procedures for settlement as well as prevention of disputes, and a wide range of other issues (Salman, 2007).

In 1986, the ILA adopted the ‘Complementary Rules Applicable to International Water Resources’, intended to clarify the application of the Helsinki Rules. Notably, this extended their application also to TBAs that do not contribute water to, or receive water from, surface waters of an international drainage basin. In 2004, seeking to provide a revision and an update of its works, the ILA approved the ‘Berlin Rules’. These supplement the Helsinki Rules, are quite comprehensive and detailed, and go beyond the Helsinki Rules and the Watercourses Convention. Worth noting is that several of the revised Rules are applicable to (the management of) all waters, both national and international, which is a major deviation by the ILA from its previous work, which dealt exclusively with transboundary, shared waters (Salman, 2007). The ILA claims that in doing so, the Berlin Rules summarize customary international law on freshwater resources. This is one of the reasons why they are disputed, for instance by members of the ILA’s Water Resources Committee who dissented against the customary status of some of the norms supposedly codified in the Berlin Rules (Bogdanovic et al.,



2004), as well as the application of principles of international law to waters that are entirely domestic (Burchi, personal communication).

Meanwhile, to fill the gaps on groundwater resources in the binding treaties on watercourses the UN International Law Commission (ILC) prepared and adopted the Draft Articles on the Law of Transboundary Aquifers. This effort sought to codify the customary international law applicable to groundwater, with technical support from the UNESCO–IHP (the Intergovernmental Hydrological Program); hence it considered and covered issues of main importance for hydrogeologists, as well as for policymakers and legal experts (Stephan, 2011). The Articles were subsequently acknowledged in several UN General Assembly resolutions, the latest from 2019,<sup>47</sup> and are formally annexed to the two of those (see UNGA, 2008; 2013). All types of transboundary aquifers are covered in their scope, including non-recharging aquifers and those that otherwise are not connected to any surface water bodies. In addition, the Draft Articles consider land use since they also apply to other activities that have or are likely to have an impact on TBAs.

The entering into force of the Watercourses Convention in 2014 provided additional legitimacy to the customary principles and rules of international water law that are codified in it, including the general duty to cooperate and its expression through various specific cooperation obligations (Leb, 2015). As noted above, though, the duty of cooperation relating to monitoring and exchange of technical information concerning TBAs has not yet gained so much acceptance among states that it may be considered a requirement under general international law. Nonetheless, the provisions of the Draft Articles have adopted the UN Watercourses Convention's duty to cooperate. Regular exchange of data and information is also stipulated. Where knowledge about the nature and extent of the transboundary aquifer or aquifer system is inadequate, aquifer states are required to employ their 'best efforts' to collect and generate more complete data and information, taking into account current practices and standards. Such steps shall be taken individually, jointly or through international organizations. An aquifer state may request another to provide data that is not readily available, if necessary, upon payment for reasonable costs – giving due consideration to the expenses of collecting data. Aquifer states are also required to monitor their TBAs/aquifer systems and to exchange the resulting data.

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<sup>47</sup> The resolutions are listed on the International Water Law Project's [website](#). Notably, the 2008 and 2011 resolutions only "[e]ncourages the States concerned to make appropriate bilateral or regional arrangements for the proper management of their transboundary aquifers, *taking into account* the provisions of these draft articles" (Res. A/RES/63/124, para. 5) (emphasis added). Beginning with the 2013 resolution, the language was changed to the stronger "*Commends* to the attention of Governments the draft articles on the law of transboundary aquifers annexed to the present resolution *as guidance* for bilateral or regional agreements and arrangements for the proper management of transboundary aquifers" (Res. A/68/470, para. 1) (emphasis added).

The Draft Articles are not yet fully approved and thereby lack binding status but are considered soft law. Nonetheless, they incorporate certain generally accepted principles on state behaviour, found in a number of contemporary, relevant transboundary aquifer arrangements, and constitute a significant step in the regularization of the customary international law applicable to internationally shared groundwater. Experience of how international law can emerge and evolve suggests that this instrument has already had certain legal effects in the sense that its ‘normative propositions’ can serve to guide negotiations over TBAs (Eckstein and Sindico, 2014). The reform-centric Draft Articles are suitable to guide concerned aquifer states wishing to make use of them, and the UN General Assembly (2008) encourages such parties to take them into account. Furthermore, the Draft Articles’ provisions on protection are of interest to management as they call for aquifer states to identify the recharge and discharge zones<sup>48</sup> and to take appropriate measures to prevent and minimize detrimental impacts on the recharge and discharge processes.

Finally, the Model Provisions on Transboundary Groundwater with commentaries were developed by the Legal Board and the Core Group in Groundwater of the UNECE Water Convention and adopted by the Meeting of the Parties in 2012. The Provisions build upon the Draft Articles aiming at providing guidance for the implementation of the principles of the Convention to TBAs and improving cooperation on integrated management of transboundary surface water and groundwater.

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<sup>48</sup> The definition of a ‘recharge zone’ is “the zone which contributes water to an aquifer, consisting of the catchment area of rainfall water and the area where such water flows to an aquifer by run-off on the ground and infiltration through soil” (Art. 2(g)). The definition of a ‘discharge zone’ is “the zone where water originating from an aquifer flows to its outlets, such as a watercourse, a lake, an oasis, a wetland or an ocean” (Art. 2(h)).

## 5. Discussion

The case of the EDTWP is peculiar in the sense that the pumping of groundwater in Ethiopia, for the benefit of users in neighbouring Djibouti, is seemingly not interfering negatively on the latter country.<sup>49</sup> In other words, no ‘significant harm’, as regulated under international water law, would be at stake. On the contrary, the project serves Djibouti in terms of fulfilling the state’s duty to provide drinking water as a human right and achieve SDG 6.1. Nonetheless, the project illustrates how one state can allow the transfer of scarce water resources from its territory to a neighbouring country at no cost, and without paying respect to procedural rules that aim to safeguard insight into decision-making processes. This section of the report seeks to discuss a set of themes of relevance to international cooperation for water resources sharing and TBAs, and provides concrete recommendations for sustainable development and management of the Kullen Valley.

### 5.1 The role of cooperation for (ground)water security

#### 5.1.1 Transboundary water cooperation and human rights

Regardless of whether the EDTWP well-field and recharge zones lie entirely within Ethiopia or are found to be hydraulically connected to the AF059 TBA, the general duty of cooperation under international law is of interest due to its integrated position in human rights law. Two main aspects must be highlighted here: first, whether the applicable obligations have been met; and second, what the limits to international cooperation mean in this case.

International water cooperation principles have implications beyond how Ethiopia’s multi-level administration must answer its citizens’ rightful human rights claims and entitlements. It must implement, as a core obligation that cannot be delayed with reference to progressive realization, access to a minimum essential amount of water that is sufficient and safe for personal and domestic uses and to prevent disease. General Comment 15 and the human rights-based approach further require this to be conducted in a non-discriminatory fashion while abiding by other human rights standards. The same duty rests on Djibouti concerning its people.

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<sup>49</sup> As this has not yet been investigated, it cannot be excluded that the cone of depression from the well-field in the Kullen Valley crosses into Djibouti and diverts groundwater from Djibouti into Ethiopia.

The obligation to respect existing water supply arrangements has been upheld by courts globally, for instance when the state of Botswana sought to prevent a well-established Bushmen community from access to water on ancestral lands, specifically using a borehole that was the traditional source of water.<sup>50</sup> Similar reasoning could be of relevance in the EDTWP case if local residents were prevented from abstracting groundwater from the well-field area and/or recharge zones; whether or not this is taking place today should be investigated. Likewise, indigenous peoples and smallholder farmers must not be deprived of their means of subsistence, including water resources that may be needed for irrigation and cattle.

If individuals or groups among the local population are unable, for reasons beyond their control, to realize the rights to safe drinking water and sanitation themselves by the means at their disposal, the state is obliged to step in to provide drinking water. The groundwater resources distributed for free to Djibouti could have been used domestically instead, to contribute to realizing the right to water in Ethiopia. The water supply to Djibouti may also come at the expense of future Ethiopian generations' entitlements, if groundwater depletion and/or decrease in recharge occur in the near or distant future and thereby cause water insecurity.

These aspects remain in part hypothetical as it is uncertain, in this case, if any local population has been negatively affected due to the project. However, if it is unclear to the local, regional, and federal level administration exactly what the needs and requirements are for the area residents, this is largely due to insufficient capacity to assess these issues. In such cases where the states of Ethiopia and Djibouti cannot take appropriate measures to the maximum of their available resources towards the full realization of the right to safe drinking water and other entitlements, they are obliged to seek and receive the technical assistance from the international community and donor countries that is necessary to make up for the lack of resources and capacities in order to implement their obligations.

The two countries have fulfilled this criterion in different ways. In Ethiopia, the international community is already extending technical assistance mainly through the initiatives of UNICEF and others to map the hydrogeology, arrange borewells, and provide safe drinking water in a sustainable, cost-effective, and suitable way (Godfrey and Hailemichael, 2016; UNICEF, 2018).

To some extent, this is also the case in Djibouti whose need for additional water resources to realize the right to drinking water is – at face value – the *raison d'être* of

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<sup>50</sup> *Mosetlhanyane v. Attorney General* (Court of Appeal). CA CLB07410. 2011. <https://www.elaw.org/content/botswana-mosetlhanyane-v-attorney-general-civil-appeal-no-caclb-074-10-20110127-court-appeal>.

the EDTWP. This country has, however, chosen to take up commercial loans from China for the EDTWP infrastructure expenses.

The need to mobilize substantial financial aid to meet global water needs is regularly on the meeting agendas of international bodies. Notably, the SDG 6 Global Acceleration Framework stresses that “Optimized financing is essential to get resources behind country plans”.<sup>51</sup> Financial cooperation and technical assistance involve ODA spending,<sup>52</sup> advocacy on the normative content of the right to safe drinking water, and pushing for accelerated work toward the achievement of SDG 6 and other targets interlinked under the 2030 Agenda. General assistance including capacity building trainings is provided indirectly by UN-Water, UNESCO, UNICEF, WHO, and directly to Ethiopia and Djibouti through the EU, financial institutions, and international development cooperation agencies as well as NGOs. With respect to groundwater, technical conferences and meetings serve to further information sharing and advance the knowledge base.

Given the geographical location of the EDTWP on the drought-prone Horn of Africa in an era of climate change, the international community must take a proactive approach to prevent problems with water insecurity, which can be foreseen in connection with the increasing pressure on global water resources. In case of future drought disaster and humanitarian crises – which are more than likely to occur – a more direct obligation to provide development aid falls on the shoulders of countries in a position to assist.

Box 2. Technical assistance of relevance to water security and TBAs.

Additionally, from the information at hand, it also seems as if Ethiopia did not pay due respect to the procedural obligations including duties to provide the concerned communities with information, facilitate their participation in public decision-making, or provide access to remedies.<sup>53</sup> An unknown number of undisclosed decisions concerning the EDTWP have been made solely by the governments of Djibouti and Ethiopia (with China). The processes have bypassed directly concerned local people including vulnerable groups, such as women, children, elderly, and

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<sup>51</sup> <https://www.unwater.org/sdg6-action-space/>.

<sup>52</sup> Indicator 6.a.1 tracks the amount of official development assistance (ODA) that is included in a government-coordinated spending plan on water. As per the latest figures, 220 UN Member States received official development aid <https://www.sdg6data.org/indicator/6.a.1>.

<sup>53</sup> These are obligations under the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, Art. 1 and the African Charter on Human and Peoples’ Rights, Art. 24.

pastoralists. In lieu of an EIA,<sup>54</sup> the matter of remedies needs to be investigated to ascertain that no continued human rights violations take place.

There are, simultaneously, limitations to the duty to cooperate. As a point of departure, the governance and management of a domestic aquifer remain subject to state sovereignty. Ethiopia is neither expected to, nor can it be held responsible for not realizing the human right to safe drinking water for citizens of Djibouti in Djibouti under international human rights law. Likewise, the African Charter on Human and Peoples' Rights suggests that there are no obligations imposed on UN State Parties to assist another state to fulfil the latter's duties to ensure the realization of the rights of its inhabitants. Therefore, Ethiopia's decision to allocate groundwater resources to its neighbour through the EDTWP is not due to a *binding obligation* under international or African human rights regimes. As a recipient of development aid, this country's duty to cooperate primarily consists in seeking (and accepting) technical assistance from the international community and donor countries, as explained above.

This being said, it is clear that the EDTWP contributes to achieving the human right to safe drinking water and to SDG 6.1 in Djibouti (albeit not yet formally to target 6.5 and its second indicator, transboundary basin area with an operational arrangement for water cooperation). Historically, there have been misinterpretations of the extraterritorial scope of the international human right to water influenced by the discourse around commodification of the resource in a time characterized by expanded free-trade agreements (cf. Walton, 2010). In 2010, when the right to water was recognized as an inalienable human right by the UN General Assembly as well as the Human Rights Council, Canada did not vote in favour of the resolutions, and had previously voted against others on this topic – due to the water exports issue. The country did not want to become obliged to share water resources with or otherwise provide its relatively water-poor neighbour with supplies (Barlow, 2007). Canada remained a leading opponent of the rights to water and sanitation until 2012 (Amnesty International and WASH United, 2015), explaining that “the right to safe drinking water and basic sanitation does not encompass transboundary water issues, including bulk water trade, nor any mandatory allocation of international development assistance”.<sup>55</sup>

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<sup>54</sup> It has been asserted that residents of the well-field area were instructed to evacuate to “at least 70 km away” (ZeHabesha, *ibid*). This claim, and whether it would amount to unlawful arbitrary displacement, cannot be established.

<sup>55</sup> See [https://www.un.org/ga/search/view\\_doc.asp?symbol=A/CONF.216/12](https://www.un.org/ga/search/view_doc.asp?symbol=A/CONF.216/12). The water justice movement at that point stressed that water is part of the global commons increasingly threatened by free trade including the transnational corporate interests in privatizing water into a purely commercial good, but also endangered by the risk of violent conflicts between neighbouring States. Canada's legislators prepared to ban permits for water exports to the USA, citing environmental protection concerns in order not to break the North American Free-Trade Agreement or other international trade treaties, worried that selling any water to the USA would force the country to open the resource

### 5.1.2 Water transfer (export) and water security: From governance to hydro-solidarity

A cross-border water supply project of the kind seen in the EDTWP is not a new solution to water insecurity. Water transfers – whether large-scale engineering interventions to divert water within and between river basins, or any other infrastructure to move water from one place to another for human utilization – take place in response to freshwater being unevenly distributed. Today, these technical feats re-engineer the global hydrological network and flows, create ‘artificial rivers’, and emphasize the need to include these projects in global hydrological flow models (Shumilova et al., 2018). Bulk water transfer between countries is practiced by Malaysia/Singapore, Israel/Jordan, and the USA/ Mexico and USA/Canada. In the case of the USA and its neighbours, groundwater is directly involved. Large-scale water exports between more distant countries – mainly by container ships – featured on the agenda around 2010 but the interest waned soon thereafter because of the financial and logistical difficulties.

Forest (2012) defines international water transfer as the removal and transfer of bulk water from one country to another following human intervention, often regulated as resources diversion and export under Free Trade Agreements. The literature also conceives of such transfers as hydro–social processes that are part of water conflict management as well as symbols of border culture and friendship. In an analysis of the actual collaborations over Canada’s TBAs, the author refers to the water transfer cooperation as “transboundary inter-local water supplies”. In the case of Canadian–American cross-boundary transfer, partnerships often evolved informally within ‘grey areas’ of water governance and as a result of local scale diplomacy, but were nevertheless effective in addressing water scarcity. Unlike bulk transfer exports, the inter-local transboundary water supply agreements were negotiated and implemented by lower-level authorities, involving public institutions representing the interests of their respective local populations and subsequently recognized by upper levels of government.

However, Forest (2012) also finds that most beneficiary communities had no legal or formal say with respect to their water supplies. This is explained by the absence of political leverage or official representatives. Moreover, there was no transnational organization in charge of overseeing the management and transfer of water supplies. This had significant consequences, especially in terms of law, improvement grants, liability, and accountability, all of which are concepts tightly connected to territorial jurisdiction. As a result, governance conditions became asymmetric.

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to all American companies (Walton, 2010). Under the NAFTA – which came into effect in 1994 and was replaced in 2020 – water was defined as a ‘tradable good’ and referenced as a ‘service’ or ‘investment’. Once water was bought or sold it would no longer be protected, and must be subject to the deal. If a corporation was granted permission to export water anywhere in Canada, water would become a tradable good under the Agreement (Barlow, 2007).

The EDTWP is not about commodification of water or making the resource an object of trade; Ethiopia does not sell its groundwater to Djibouti. However, while the EDTWP can be portrayed as a token of good neighbourliness, the hydro-social processes behind the scenes are concealed from scrutiny. The tripartite contracts are not the results of informally or organically developed partnerships between communities on different sides of an administrative border. Instead of being the result of 'local scale diplomacy', the 'grey areas' of water governance here signify deals entered by officials at the highest level of decision-making, ignoring good governance principles and human rights standards when denying Regional state bodies and local stakeholders alike the opportunity to be part of the processes.

Another relevant matter is whether the transboundary water transfer in question can jeopardize Ethiopia's water availability beyond its current problems. The position of the country as 'the water tower of Africa' refers to its comparatively large share of water resources on the continent, as well as to the presence of three principal drainage systems feeding the Blue and White Nile, which originate in the Ethiopian central highlands (Godfrey and Hailemichael, 2016). Despite twelve major rivers, however, drought and water scarcity characterize the country's development trajectory, and in particular the region where the well-field lies that Djibouti now depends on. The Information Sheet for the AF059 projects that by 2030, there will be a 28 per cent reduction in renewable groundwater per capita in Ethiopia (IGRAC and TWAP, 2015). Similarly, based on research by the British Geological Survey and others, Nijsten et al. (2018) forecast that at least one of the countries sharing the Afar Rift valley/Afar Triangle aquifer will be under medium to very high groundwater development stress and a high dependence on groundwater (> 40 per cent) in 2030 and/or 2050. Considering the very high reliance on groundwater already today, future use necessitates precautionary measures and active prevention of over-draft. In short, concerted efforts are needed to ensure governance and management so to reduce the risks of abstraction that exceeds the natural and/or managed recharge and depletes or even mines the resource. This is also of interest to the international community, to safeguard development, wellbeing, and poverty alleviation through enhanced water security.

Further, according to analysis of the basin-wide conditions in the Awash basin, there is a consistent trend of increasing temperature projection while precipitation is projected to be drier for the early months (April, May, and June) before the main rainy season (July–August). The findings indicate that from a hydrological perspective, these trends can cause a decrease in water availability due to low precipitation and high evapotranspiration caused by the increase in temperature (Teferi Taye et al., 2018). The risks of overexploitation – combined with risks from recurrent, prolonged drought – can be severe when there is simultaneously increasing dependence on groundwater resources for personal, domestic needs as well as



productive uses (livestock and agriculture) and general poverty alleviation. Future challenges of climate impact on the recharge volume have not yet been considered as an Environmental and Social Impact Assessment was not conducted for the EDTWP.

In general, the nature and intensity of water-related risks faced by rural communities are strongly determined by their location in the Awash basin due to variations in climate. Rural communities in the arid lowlands face higher risks from water scarcity while communities in the highlands suffer from crop destruction from flooding. As seen during the 2015/16 drought, subsistence farmers have limited resources to mitigate the impacts through groundwater access and are, therefore, highly vulnerable (Murgatroyd et al., 2021).

When embarking on the project in 2011, Ethiopia's interests in granting free drinking water to Djibouti may have been presented as emanating from "a recognition that the peoples of the two countries 'have blood ties'", as the ambassador to Djibouti, Mr Shamebo Fitamo Adebo, said in 2017 (Getachew, 2017). Both countries were also interested in cementing relations with China for other infrastructure investments, such as renovation of the Addis Ababa–Djibouti railway network.

But for whom is the project beneficial? Around 2014–15, it became controversial in some Ethiopian circles. As summarized by Mormul (2016), critics raised concerns about the agreement being kept confidential until its official announcement, and claimed that the cost of access to the port in Djibouti was the same as prior to the project deal;<sup>56</sup> so was there perhaps a secret government deal behind it all? In addition, groundwater transfer from the Somali Region – generally known for suffering from water scarcity – and the (unresolved) water supply problems for local communities did not speak in favour of a 'free donation'. Critics also suggested that forced evictions had been taking place. Much of this scepticism over the drivers and motives behind the project related to the Tigray People's Liberation Front, the regime in power at the time of the decision-making. These, in turn, can be seen in the light of inherent tensions between the fundamental idea of the regional states' autonomy – as guaranteed by the FDRE Constitution – as well as the perception of having jurisdiction over groundwater (as asserted in [Section 3.2.2](#)), and the centralist Federal view, based on how the FDRE Constitution (Art. 40(3)) grants to "the state" the exclusive right to ownership of all natural resources, on behalf of "the people".

China's position and foreign direct investment in the EDTWP are relevant not only to the project but also with respect to the bilateral relationship between Ethiopia and

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<sup>56</sup> This indicates that no rebate on the price of port access had been offered, but it has not been possible to verify this.

Djibouti. The latter country's proximity to the Middle East, its location on the energy transit roads, and position on the Bab al-Mandab Strait, all make this country of great importance for global powers. In recent years, China–Djibouti relations have developed and achieved fruitful results in various fields. China is the largest trading partner of Africa as a whole. Djibouti's strategic location at the mouth of the Red Sea – at the crossroads of one of the busiest shipping lanes in the world – makes Djibouti an ideal trans-shipment hub for cargo in and out of the MENA region and a critical asset for Chinese economic interests. Since China's launch of its Belt and Road Initiative (BRI) – a global infrastructure development strategy – in 2013, Djibouti has been a critical logistic and trading hub, which envisages the strengthening of maritime trade routes through the largest deep-water port in East Africa. In 2017, China established a naval base in Djibouti, the first time it has sought a permanent military presence beyond its borders. In the same year, the two countries also agreed to establish a strategic partnership to strengthen all-round cooperation. Djibouti actively participates in the BRI, under which China has expanded relations primarily through growing economic ties. Most of Djibouti's major infrastructure projects, which have been valued at USD14.4 billion, are funded by Chinese state-run banks. In exchange for concessional loans to finance projects for its partners, Beijing signs lucrative contracts to supply raw materials (Chaziza, 2021).

The investment in Djibouti and in the EDTWP is furthermore significant as part of China's 'overseas strategic strongpoints' to safeguard water supply, and part of the larger geopolitical give and take of cooperative arrangements in the region. Dutton et al. (2020) note how Chinese firms see Djibouti as a major trans-shipment hub and a key to unlocking the economies of the Horn of Africa – most notably, landlocked Ethiopia.

The EDTWP itself is presented as an engineering feat of the BRI. At the time of inauguration, it was heralded as the largest single water supply project in Africa, integrating unprecedented and advanced technologies (Yifeng and Zelele, nd). Since the beginning of Chinese President Xi Jinping's ambitious strategy in 2013, the BRI has leveraged China's expertise in infrastructure projects, and ample foreign currency, to build new global trading routes known as the Silk Road. Linked to this, analysis from the AidData research lab shows that Chinese debt burdens are now 'substantially larger' than previously understood (Dreher et al., 2021; Dreher et al., 2022).

The funding often comes in the form of risky, commercial high-interest loans. Indeed, Djibouti recently had to restructure its debt with the Exim Bank (Ahmed, 2021). U.S. officials raised concerns long before this as the debts to Chinese banks have reportedly increased to more than 70 per cent of Djibouti's gross domestic product and risk causing the tiny East African nation to fall into a debt trap that will allow banks to take over ownership of key strategic assets. It is common for China to

provide resource-backed loans where repayment is either made directly in natural resources (in kind – such as oil or minerals), or repayment is guaranteed by a resource-related income stream, or where a natural resource asset serves as collateral. Such loans are also regularly opaque with key contract documents, and even basic information such as interest rates, very rarely made public (Mihalyi et al., 2020).

With respect to the EDTWP, though, it is unlikely that Ethiopia's groundwater resources were made a collateral of the loan agreement between China and Djibouti. Nonetheless, Djibouti's natural asset is the deep-water port, in which Chinese interests are growing due to the recent development of an International Free Trade Zone, expected to be Africa's largest. The port-related businesses are also in need of freshwater, and groundwater transferred from Ethiopia seems to be meeting part of those needs.

The Chinese loans also come without the demands for improvements on human rights that often accompany Western aid (Bearak, 2019). By turning to China for commercial loans instead of seeking traditional development assistance from donors, countries avoid scrutiny of its democratic reform agenda as well as human rights realization and SDG reporting. It is worth remembering that to China's Exim Bank and the multinational contractor company, the EDTWP is not development cooperation but a business contract. However, if coming with conditions of full-cost recovery based on tariff collection, such policies, when unaccompanied by appropriate safeguards, can raise serious concerns about lack of affordability and its adverse impact on the poorest populations. In this respect, the Special Rapporteur on the human rights to safe drinking water and sanitation (2016) referred to the Maastricht Principles on Extraterritorial Obligations and stressed that states must at all times observe the human rights principles of non-discrimination, equality, including gender equality, transparency and accountability; these non-binding principles also apply to China as a party to the ICESCR. ONEAD has a social tariff policy in place and reports regularly to the UN Human Rights Council on how it implements the right to drinking water for its population; yet the country's loans are burdening its finances.

International water transfer projects are likely to grow in importance. Under the ICESCR, the international human rights framework requires sovereign nations to progressively realize established human rights within their borders and for their population, and to report these steps to the UN. Today, political commitments accompany the applicable legal provisions, in particular SDG 6.5.2 that monitors implementation of IWRM at all levels by 2030 with a focus on the degree of transboundary cooperation. Together, this set of prescriptive norms seeks to rule international cooperation, but collaboration over national resources and water supply can take other routes and play by alternative rules.

The EDTWP is not a deal motivated by the need to fulfil human rights obligations. Rather, the cross-border water supply projects is as an example of a contractual agreement between countries, in good faith and possibly in the spirit of cooperation and partially based on hydro-solidarity and moral grounds. Abdelhady et al. (2015) find that national interests and hydro-solidarity have an important meeting point, requiring short-term negative implications of water management decisions to be carefully managed through intensified collaboration for the more long-term sustainable goals to be attained and to protect future generations and safeguard intergenerational fairness. In the case of the EDTWP, this suggests that for Ethiopia, solidarity trumps culturally motivated conceptualization of rightful claims over the water resources exported from the Kullen Valley. For China, a country that practices ‘good neighbourliness’ in line with the *Five Principles of Peaceful Coexistence*, the duty to cooperate is generally embraced when dealing with issues on its transboundary surface waters. It has been suggested that it can also consolidate its emerging role as a ‘good neighbour’ in the field of transboundary groundwater through international cooperation (He, 2017). Considering the long reach of the BRI investments, the definition of ‘neighbour’ should be expanded geographically to also apply to TBAs that are not directly shared between China and an adjacent state, but which the country relies on geopolitically.

## 5.2 Future steps: TBA or not TBA, that’s the question

A shared natural resource can indeed give rise to diverging views on where the border between sovereign states is to be drawn. Complexities abound around aquifers as such, being the hosts and matrix of invisible groundwater that has, from a legal perspective, long been regarded as something mysterious. With groundwater reliance increasing at all scales, the dependence on TBAs is also set to grow – and thereby the difficulties in establishing and consenting on their characteristics and asset values. It has been said that no two aquifers are alike; moreover, no two aquifers are perceived equally by overlaying communities (Eckstein, 2012). This calls for context-dependent approaches and a local knowledge lens, drawing on participatory methods where possible, to determine recharge zones, yield, and groundwater flow as well as other aspects of importance for governance and management. Sindico (2020: 3) argues that countries may “characterise the complexity of their respective groundwater resources and find that an aquifer crosses underneath their shared border [... and] appreciate the need to manage the transboundary aquifer together”. Ideally, the countries would then also be “interested in identifying relevant international rules and practices that can shed light on how the aquifer can be used and protected at the same time in a way that benefits both countries”. However,

legally binding agreements of some sort have been formalized for less than a dozen TBAs (cf. Burchi, 2018; Callegary et al., 2018; Sindico, 2020).<sup>57</sup>

Apparently, a twofold premise applies in theory but not always in real life for agreements and arrangements on TBAs. First, there is a common *scientific* understanding that two (or more) sovereign states indeed share an aquifer (system). Second, there is *political will* on all sides of the border to develop a joint normative framework to govern it by strengthening cooperation and protection. In practice, though, the ability to ‘see the unseen’ groundwater resources and investigate whether ‘invisible’ aquifer systems cross political, administrative borders (including domestic, trans-regional borders) is ridden by complexities and high costs.

The term ‘transboundary groundwater’ commonly implies a body of groundwater intersected by a political border with a potential threat of dispute over a shared resource. As Cobbing et al. (2008) find, this definition is inadequate in many parts of southern Africa due to low transmissivities. The matter is also scale dependant: local groundwater security may rely on low-yielding low TBAs which, if stressed enough, can cause the same depletion issues.<sup>58</sup> Kebede et al. (2010) stress, with respect to the Draft Articles’ definitions, that the implications of a ‘shared aquifer’ are more complex than the mere physical sharing of a body of groundwater. Besides aspects such as flow and storage properties, the socio-economic dependence on groundwater resources needs to be considered and accommodated. Given this, the Draft Articles are maybe less likely to inform and guide negotiations and agreements between aquifer states.

When identifying and prioritizing aquifers for management interventions (including when prioritizing zones/hotspots/actions within aquifers), transboundary and trans-regional groundwater systems alike could benefit from applying socio-economic and political criteria. This forms part of a ‘transboundariness’ approach, developed by Sanchez et al. (2018), which enables improvement of aquifer characterization based on variables in addition to mere physical boundaries. Population metrics, water quality, data/research availability, political recognition of the aquifer as being transboundary, cooperation efforts, and other issues governing the agenda are included. This method could increase the level of attention paid to the issues at stake, alongside climate change-induced impacts on aquifer recharge as these challenges will only escalate with growing variability and unpredictability.

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<sup>57</sup> The North-West Sahara Aquifer System; Guaraní; Nubian Sandstone Aquifer System; Al Sag/Al Disi, Ocotepaque–Citalá; Mexico–USA; and Genevese Aquifer. A formal declaration has been signed for the Senegal–Mauritanian Aquifer Basin declaration and an agreement for the Iullemeden and Taoudeni/Tanezrouft Aquifer Systems has not yet been ratified by any parties. Several other non-binding or unofficial arrangements are in place, for instance on the Stampriet Transboundary Aquifer System.

<sup>58</sup> Fraser, personal communication.

The question is what appetite Ethiopia may have to explore the transboundary nature of the Kullen Valley and the AF059. The EDTWP as such may not be of immediate relevance to Ethiopia today, when the project's value in exchange for secured port access in Djibouti is – supposedly – diminished. Ethiopia's interests in granting free water to Djibouti was once directly linked to this gateway to the seas, especially after the 1998–2000 war with Eritrea that led to Djibouti emerging as Ethiopia's primary outlet for its trade. Today, however, Ethiopia seeks to diversify its sea outlets, and thus its dependence on Djibouti is decreasing. While still central to Djibouti's economic growth, since 2010 Ethiopia has been planning to shift much of its cargo to Somaliland's Berbera port (Ahmed, 2021). Hence, establishing whether this well-field and the aquifer in question is part of a TBA, and ensuring water supply sustainability for its neighbour, may not be prioritized politically. Ethiopia may also consider that there is ample time to decide which of its TBAs (if any) should receive attention and funds for in-depth assessments and specialized management of vulnerable hotspots.

If so, this reinforces the need for studies based on international cooperation's technical assistance, to explore the risks connected with over-exploitation as linked to the (potentially increasing) dependence on this very groundwater in Djibouti. The momentum of SDG 6.5.2 provides an additional push; however, the reporting expectation in the SDGs on countries with transboundary basins and aquifers does not provide enough incentive to improve data gathering and enter joint operational arrangements.

The international community's assistance is critical to gather more knowledge on TBAs, to identify resources development risks, and formulate governance and management policies. There is a need for a joint groundwater database and information system based on monitoring. Through the Cooperation in International Waters in Africa, the World Bank's Horn of Africa Regional Groundwater Initiative targets the IGAD region, covering Djibouti, Ethiopia, Kenya, Somalia, South Sudan, Sudan, and Uganda. This project aims to strengthen the knowledge and analytical foundation for sustainable development of groundwater resources and support transboundary cooperation for their management. It involves a hydrological assessment as a basis for investments aiming at building resilience against climate variability (Lakew, personal communication).

Scientific cooperation initiatives exist around the world in the framework of technical projects. Some aim at joint scientific assessment while others tackle the management of specific issues. The role of regional and international organizations and donors can be critical particularly when the countries concerned are not on par with regard to capacity, knowledge, information and confidence (Stephan et al., 2022).

Existing international groundwater cooperation also includes the cross-continental governance structures of AMCOW and its Pan Africa Groundwater Programme, the African (International) Network of Basin Organizations (ANBO/INBO), African Union, and international organizations such as AGW-Net, BGR, IGRAC, UNDP, UNEP, Cap-Net, UNECA, IWMI, and the former GW-MATE team of the World Bank. Concerted efforts may benefit from understanding the hydrogeology of the AF059 and pave the way to establish its extent. In turn, this is of importance whether the well-field in Kullen is hydraulically connected with this TBA or not.

Meanwhile, IGRAC's maps are updated on a regular basis within the framework of the Internationally Shared Aquifer Resource Management (ISARM) programme (IGRAC, 2021 and the online Global Groundwater Information System). TBA inventories have progressed but remain works in progress; more detailed studies have yet to be made for most systems, and long-term commitment is necessary for cooperation to be formalized and have an impact at local levels (Nijsten et al., 2018).

The data used for the AF059 Afar Rift valley/Afar Triangle Aquifer information sheet was made available by national and regional experts from countries involved in the groundwater project of the Transboundary Waters Assessment Programme (TWAP) funded by the Global Environment Facility (GEF). A disclaimer says that “[v]alues given in the fact-sheet represent an approximate guide only and should not replace data obtained from recent local assessments”.<sup>59</sup> Given how experience from UNICEF's water supply projects in the Sitti Zone suggests that the local population has certain knowledge of the recharge areas and the groundwater flow, it would be valuable to capture such insights. In doing so, it must be ensured that the outcomes of participatory mapping are mutually beneficial: a collaboration should involve local communities in data generation and analysis based on their knowledge of the landscape conditions, as well as translating scientific findings into user-friendly information of importance to the population on the ground. It is increasingly argued that applied hydrological studies, with their resources assessments and management, should integrate social science (Callegary et al., 2018).

Studies are required to establish hydrogeological conditions and to map, examine, and precisely delineate the extent of the TBA and make necessary modifications to the AF059 map. To this end, as well as to better understand the Kullen Valley's groundwater system, data from hydrochemistry, isotope and the hydrostatic condition, well drilling and pumping test data, geophysical surveys, and other methods will be critical. As part of these assessments, the impacts of the EDTWP on wetlands downstream of Lake Abbe should also be determined.

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<sup>59</sup> <https://ggis.un-igrac.org/documents/1639> (August 2021).

### 5.3 The EDTWP: Recommendations for sustainable management

The Ethio–Djibouti Water Transfer Project case that has served to illustrate the need for more robust information about and improved collaborative governance over TBAs deserves to be commented on in its own right. The need to protect the groundwater resources in question from negative environmental circumstances and inadequate governance can benefit from recommendations on best practices for the continued management of the Kullen Valley and surrounding recharge areas. Integrating sustainability measures is crucial to maintain the longevity of the well-field – to address the source of the water supply, as well as social, environmental, institutional, technological, and economic and development concerns of the project area in particular and the region in general. However, the groundwater budget and its potential are not yet clearly explored. It is erroneous to regard underground resources as limitless and infinite; yet large volumes of water are abstracted every day without concrete knowledge about the hydrologic nature of the aquifer system. This can, moreover, be expected to increase when the electricity supply is secured. As a result, and if this resource is depleted, it may lead to potentially devastating socio-economic and environmental consequences.

Understanding the aquifer system of the Kullen Valley, the aquifer rejuvenation, and groundwater potential is urgent. To this end, actions for MAR may need to be planned and implemented, asking questions such as: What is the maximum amount of water that can be available for abstraction with no jeopardy to the resource? What are the components of the groundwater budget and how to figure out the balance? Is there an option to immunize the resource to ensure its sustainability under stress abstraction conditions?

First, by employing groundwater models and setting optimization targets to effectively utilize the resources in a sustainable way, the involved countries can take knowledge-based decisions and timely risk mitigation actions. This, in turn, enables a strategy to balance the exploitation level of the resource within the acceptable threshold limit.

Second, by determining and setting recharge enhancement options for the aquifer system in question through artificial means such as MAR, using runoff to augment the natural recharge, the uncertainty about the groundwater budget can be mitigated.

Third, by using an evaluation model that reflects the groundwater potential of the area and setting a maximum acceptable groundwater abstraction level, the optimum abstraction from the Kullen Valley can be decided.



Fourth, institutional sustainability must underpin all actions and decisions. The collaboration between Ethiopian and Djibouti water authorities is paramount to achieve groundwater risk mitigation and safe use of this limited resource. This needs to build on an extensive study of the target area and involve local knowledge and local institutions to protect the water catchment areas from external threats and emerging environmental factors. Such an assessment helps to identify the need for direct and indirect support to meet the objectives of protecting groundwater table like training, planning and institutional support including the promotion of enabling policies, provision of information regarding various water supply and treatment technologies, and development of maintenance and management skills. Moreover, it helps to establish a very good operation and management system that comprises protecting water supply sources, conducting monitoring and evaluation, and collaborating with internal and external organizations for on-going technical training and support, including groundwater resource management and effective development technology.

By implementing the above-mentioned groundwater management actions, the following issues can be achieved:

- Improved recharge of groundwater (quantity and quality of groundwater resources improved);
- Sustainable use of groundwater resources realized;
- Improved welfare, shared sense of ownership and responsibility of the water authorities in Ethiopia and Djibouti;
- Environmental and ecosystem sustainability of the well-field regions realized.

Investments in capacity building for data generation and exchange are increasingly on the global agenda also in terms of the business sector's responsibility to respect human rights and do its due diligence to prevent and remedy environmental harm. The conduct that companies must or are strongly advised to adopt under certain circumstances is currently pushed for by the Office of the UN High Commissioner for Human Rights and, in relation to supply chain due diligence, by the Parliament and Commission of the European Union.

## 6. Concluding remarks

Transboundary groundwater resources and shared aquifers add complexities to governance partially because of the way steering and decision-making processes actually work, which often differs remarkably from how policies, regulatory frameworks, and institutional setup are devised on paper. One definition of groundwater governance may call for certain elements and attributes, while another characterization specifies something else. A national Constitution or water policy may demand certain arrangements, but the reality requires something else, and something else again the next day with other actors and realities.

TBAs also necessitate diplomacy, which in practice often takes place along more or less informal multi-track procedures involving national-level ministries – but also policy advisors, technical experts, and intermediaries. Progress in dialogue facilitation and negotiations depends, to a large degree, on there being political will and commitments, established institutions, policy frameworks, and preferably shared norms and values. Those are, in turn, products of joint efforts, trust-building, and the leveraging of expertise. Together, these elements can form dialogue entry points that result in stable agreements between those concerned.

In the absence of robust scientific assessments and understanding of the fundamentals of TBAs, governance and diplomacy become more challenging. Without binding customary international law or global treaties to lean on, it is up to the concerned aquifer states to arrange for data collection and processing and agree on procedures for the exchange of information. Decisions for planning, protection, and development can take place based on those procedures. However, history as well as socio-economic and cultural differences tend to come in to play in transboundary environments, and with them a range of perceptions of ownership and entitlements, claims and rights – and perhaps also diverging scientific notions and technical approaches.

It is not yet established whether the Kullen Valley is interconnected with the AF059 TBA. Due to this fact, much of the discussion in this report has been hypothetical and conceptual. It cannot be predicted how the countries involved in the water supply transfer would act if it was determined that there is a hydraulic connection. Critically, it is known that the groundwater system used for the water supply for the EDTWP extends into several regional states in Ethiopia, but beyond this, several questions remain. The recharge area of the AF059 may also include one additional neighbouring state, the Federal Republic of Somalia, that currently is not listed as an aquifer state.

Regardless, the EDTWP is an inter-basin, cross-border groundwater transfer project directly involving two neighbouring sovereign states, as well as a third, geographically distant but financially and technologically enabling state. The wellbeing and health of people in Djibouti depend to a great extent on the groundwater transfer from Ethiopia. This study, however, leaves several questions unanswered that are of relevance to the long-term governance and management of the aquifer and groundwater system. From an international water law perspective, it is perhaps an unusual case as it is still uncertain whether it involves a TBA. Whether the EDTWP entails pumping and distributing groundwater across a border *and* tapping into a transboundary aquifer or not, recharge zones and well-field management are of importance for sustainability. Escalating risks of water scarcity, due to increasing pressure on a shared resource and because of climate change variability, may also jeopardize the realization of human rights of people in the area where the water is sourced from. Thus, the case is concerned not only with the delineation of the aquifer system, but also with the delineation of the rights and duties of sovereign states in relation to each other, as well as individual rights-holders therein.

Ethiopia and Djibouti have become more interdependent thanks to the water supply project, alongside the collaboration on a joint railway management company set up in 2016. If this has not yet resulted in closer collaboration that includes joint groundwater collection, information exchange, and other arrangements, it may be wise to pre-empt potential future disagreements by investing in open dialogue. Transparency is of relevance for requesting hands-on technical assistance and other international cooperation, including to ensure support for management of recharge zones and MAR interventions.

The absence of an EIA and due consultation with the concerned people and communities in the well-field area and the recharge zones when the EDTWP planning was carried out and decisions were made makes the current arrangements – to the extent that it is known – less than ideal from a human rights perspective. Likewise, the apparent undermining of the Somali region's authorities as well as the (then) Awash Basin Authority's powers are not in line with the rule of law or the Ethiopian FDRE Constitution. Despite this, prior actions and omissions can still be remedied, and the project can be re-packaged as one that places people's health, standard of living, and water needs first and foremost. To safeguard the sustainability of the water supply and provide for all users' interests, it must be appreciated that countries and regions have underground assets in common. In times when the narrative is often shaped by national sovereignty and the debate is increasingly framed in terms of securitization arguments in favour of, or in opposition to, the sharing of water resources, this case speaks for collaboration, and contains a substantive kernel of potential for international cooperation.

## Epilogue

In May 2021, the President of the Republic of Djibouti inaugurated the first ocean water desalination and drinking water production plant in SSA, financed by the European Union (EUR 73 million) and the Djiboutian government (EUR 5.5 million). The ceremony, it was said, marked a breakthrough and technical progress for the Republic of Djibouti. The plant will initially produce 22,500 m<sup>3</sup> of drinking water per day to supply nearly 250,000 inhabitants. This capacity will double in phase two. The plant, built by Franco–Spanish companies, will be under an operating contract with the Tedagua company for the next five years, and ONEAD staff will be trained during this period before it takes over the service provision. Desalination, powered by a neighbouring wind farm as part of the Producing Safe Drinking Water with Renewable Energy (PEPER) investment, can henceforth complement the water from the cross-border supply from Ethiopia. Diversification is seen as a key to expanding Djibouti's energy sector – and is key also to its water security (Tempest, 2021). The day has come when the cost of desalination technology and energy has dropped enough to make it cheaper to generate freshwater from saltwater than to import it from another country. Thereby, irrespective of this being a deliberate move to become more self-sufficient through an autarkist policy, the outcome is that Djibouti has now secured its long-term water supply needs while reducing its reliance on groundwater imported from Ethiopia as well as on commercial loans from China.

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