FCC

STUDY GUIDE

TEDMUN

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ANKARA
TED ANKARA COLLEGE
FOUNDATION HIGH SCHOOL
MODEL UNITED NATIONS

TEDMUN'24, FUTURISTIC CRISIS COMMITTEE

"RISE OF ARCTIC CRISIS: INCORPORATION OF CLEAN WATERS

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1. Letters

a. Letter From the Secretary General

Dear participants of TEDMUN 2024,

My words could not start without a quote that enlightens and motivates the whole spirit of this conference: “Peace in home, peace in world.” Although Mustafa Kemal Atatürk is known to be a great military commander and a brilliant government man, he was unique. At that time, while most of the leaders had rather aggressive views regarding the importance of International Diplomacy and Foreign Affairs, Mustafa Kemal Atatürk knew that the future of the modern world and a future modern Türkiye must be tenant to diplomacy. It must be reminded that, our hearths and opinions lie within his words, and this conference is assembled through his enlightenment.

TED Ankara College Policy Diplomacy Club has assembled 9 conferences since 2014, and this year we are proud to be the part of the 10th TEDMUN Conference. Becoming a part of the PDC, being an MUN’er and organizing TEDMUN at the end of the 11th grade has turned into a long-lasting tradition of every TED Ankara College member. We are proud to be a part of this long-lasting tradition and glorifying our club. The TED Ankara College Policy Diplomacy Club has a rich history of fostering such principles, organizing conferences that serve as platforms for meaningful discourse and collaboration. As we continue this tradition with the 10th TEDMUN Conference, we stand as proud torchbearers of our club's legacy, committed to upholding the values of diplomacy, mutual respect, and cooperation.

For each of us, participating in Model United Nations represents more than just a simulation; it is an opportunity to engage with diverse perspectives, to forge connections, and to contribute to the collective pursuit of peace and prosperity. As Secretary-General, I am deeply inspired by the dedication and passion that each of you brings to this conference. I hope the best for your contributions to the Model United Nations, and I wish you to enlighten yourselves by recovering the embedded solutions in each conflict. In my opinion, your youth and perspectives will make this conference shine like the North Star in the Arctic.

As we embark on this journey together, let us remember the words of Atatürk and the legacy of TED Ankara College Policy Diplomacy Club. Let us approach our deliberations with open minds, empathy, and a shared commitment to building a better world. I am confident that through our collective efforts, we will not only honour our advisors but also reaffirm our belief in the power of diplomacy to transcend borders and unite humanity.

With warm regards,

Buğra Ermihan, Secretary-General of TEDMUN 2024

a. Letter from Under Secretary General

Dear delegates,
My name is Pelin Dila Altun. I'm a 10th grade student at Maya Science and Technology Highschool and I will be your Under Secretary General in this outstanding conference, TEDUMUN'24.

During the composement of this study guide my president chair Baturalp Uymaz has been a great assistance both in authoring significant parts and formatting this final product.

This Futuristic Crisis Committee that you will partake in focuses on the scenario about a possible water crisis that our globe awaits. You delegates will focus both on keeping your nation's stability and managing yours with other countries/organisations. I encourage you all to get in your roles as best as you can so that the experience will be as vivid as possible. I wish you all a magnificent conference.

For any further questions of yours regarding the procedure of the conference, and the committee, do not hesitate to contact me.

Under Secretary General, Pelin Dila ALTUN

pelindilaaltun04@gmail.com

b. Letter from President Chair

Esteemed Delegates of the Future Crisis Committee,

It is with an elevated sense of scholarly anticipation that I, as the President of the Committee Board, extend a cordial welcome to the distinguished assembly participating in the Future Crisis Committee (FCC) of the forthcoming TEDMUN'24. In my role as the appointed the President Chair, I find myself both honoured and resolute in fostering an intellectually rigorous and dynamically engaging Model United Nations (MUN) experience.

The FCC, a crucible of diplomatic urgency and strategic exigency, represents an apex of intellectual rigour within the MUN paradigm. Distinct from conventional committees, its hallmark resides in the expeditious nature of crisis dynamics, where cogent decision-making and strategic acumen are of paramount significance.

As delegates within the FCC, your roles are innately pivotal, requiring the cultivation of a multifaceted skill set that encompasses rapid cognition, diplomatic finesse, and collaborative dexterity. The impending crises are meticulously designed to serve as litmus tests for your mettle, affording a unique platform for the synthesis of diplomatic adeptness and crisis management acuity.

In my role as the President Chair of the Committee Board, my commitment is steadfast in ensuring that this conference manifests as an academic zenith, redolent with scholarly rigour and diplomatic gravitas. For any elucidations or queries germane to your preparation, we extend an invitation for open discourse.

I ardently anticipate the incisive debates, strategic cogitation, and innovative problem-solving that shall burgeon within the precincts of the Future Crisis Committee. Together, let us elevate this MUN conference to an apotheosis of academic distinction.

For any further questions of yours regarding the procedure of the conference, and the committee, do not hesitate to contact me.

President Chair, Baturalp UYMAZ

baturalp@uymaz.net

2. INTRODUCTION

a. Introduction to the Committee

The Futuristic Crisis Committee (FCC) operates uniquely, utilizing a crisis procedure to simulate dynamic scenarios. Our committee session begins on July 1, 2055. As we go on with our sessions and the crisis team gives us new crises, we will also update the time to create the most realistic atmosphere for you. Delegates are expected to immerse themselves in these imaginative events. It is essential for participants to familiarize themselves with the study guide and agenda topic, and to bring relevant documents in hard copy. The "Questions to Consider" and "Involved Countries & Organizations" sections will provide crucial insights for you to get the roles of your country and other countries or organizations.

b. Introduction to the Agenda

As we meet at the Futuristic Crisis Committee (FCC), we face a major challenge: the global water crisis has reached a critical point, and it is July 1, 2055. Freshwater, once plentiful, has become scarce and valuable, resulting in intensive exploitation of Antarctic ice Competition between countries and companies. With increasing tensions, our task is clear: we must navigate the complexities of political, economic, and environmental sustainability to find appropriate and effective solutions.

3. CHRONOLOGY

1956, Minamata Bay Mercury Pollution

The Minamata Bay Mercury Pollution was an environmental disaster caused by the release of methylmercury into Minamata Bay by the Chisso Corporation in Japan between the 1950s and 1960s. The pollution caused serious health effects on the local population including neurological damage, birth defects, and deaths.

1960, Desiccation of the Aral Sea

The Aral Sea's desiccation was mostly caused by Soviet-era irrigation projects that diverted water from its tributary rivers, the Amu Darya and Syr Darya, for agricultural uses. This dramatically reduced the sea's volume and surface area, posing ecological, economic, and social issues. As the sea shrank in size, it broke into smaller, extremely saline remnants, exposing harmful substances from the seabed and affecting adjacent towns[2].

1972, Clean Water Act

The Clean Water Act (CWA) established the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters[3]. The CWA mandated, for the first time, a minimum standard of wastewater treatment for every community in the country[4].

1972, Stockholm Declaration

The 1972 United Nations Conference on the Human Environment in Stockholm was the first world conference to make the environment a major issue. The Stockholm Declaration highlighted the need for global cooperation to address environmental challenges[5].

1977, United Nations Water Conference

The United Nations Water Conference took place on March 14, 1977, in Mar Del Plata, Argentina. The conference was the first intergovernmental meeting on problems ensuring adequate water supply for the future. Delegates from 105 countries along with intergovernmental and non-governmental organisations participated. The first Action Plan was created at the conference which recognized that "all peoples, whatever their stage of development and social and economic conditions, have the right to have access to drinking water in quantities and of a quality equal to their basic needs[6]".

1981-1990, The first UN-Water Decade

The first UN-Water Decade from 1981–1990, also known as the International Drinking Water Supply and Sanitation Decade (IDWSSD), is estimated to have granted access to safe drinking water for over a billion people globally. However, many professionals were of the view that the IDWSSD failed to achieve its goals, mainly due to its broad approach. The issues were generalised and addressed without taking into account regional, national, and community differences[7].

1992, International Conference on Water and Sustainable Development – Dublin

Principle 4 of the Dublin Conference stated that "it is vital to recognize the basic right of all human beings to have access to clean water and sanitation at an affordable price.[6]"

1994, United Nations International Conference on Population and Development

The Programme of Action from the UN International Conference on Population and Development confirmed that all individuals, "have the right to an adequate standard of living for themselves and their families, including adequate food, clothing, housing, water, and sanitation.[6]"

2000, The Millennium Assembly of the United Nations Report of the Secretary-General

The Report of the Secretary-General included the section "Confronting the water crisis" which emphasised the need for sustainable management practices, equitable access to clean water and sanitation, and international cooperation to achieve the broader goals outlined in the Millennium Declaration.

The Millenium Declaration

The Millenium Declaration outlined broad principles and commitments related to peace, security, development, human rights, and the environment. The Millennium Development Goals (MDGs) were later developed based on the Millennium Declaration's framework. The MDGs included Target 7C: Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation[9].

California Drought, United States Of America (2012-2016)

California's drought between the years 2012 and 2016 was one of the most severe in state history. A string of five dry winters left some rural communities without water, interrupted surface water deliveries to some farmers in the Sacramento and San Joaquin valleys for two consecutive years, disrupted thousands of farming jobs, pushed some fish populations toward extinction, and created conditions that fueled some of the most catastrophic wildfires in state history.

California State Governor Jerry Brown declared a drought state emergency on January 17, 2014, which will be lifted by him on April 2, 2017. However, stated that California must continue water conservation efforts. With the official conclusion of the most recent drought, which spanned water years 2012 through 2016, it is timely to compare it with other historic California droughts and also to consider some of the lingering impacts.

The drought reduced water deliveries from local, regional, state, and federal water projects at a time of historically high water demands. The table below summarises the reductions in Central Valley Project and State Water Project deliveries for each year of the drought (2012 to 2016) as well as the wet years before and after the drought (2011 and 2017), showing the drought's development. Even in wet years (2011 and 2017), the water projects cannot satisfy all water demands. In addition, different water users are often sorted differently, reflecting different legal priorities due to legislation and/or pre-project water rights.

As the drought wore on, the water projects had less stored water and reduced their deliveries, reaching a low in 2014 and 2015. In these years, some water contractors (particularly Friant) received zero deliveries for the first time since the project began in the 1950s, and sometimes lacked alternative water sources, forcing users to drill new wells or purchase water from others with a contract allocation. Such adaptations

reduced shortages and costs for many areas but brought their own costs and consequences.

Droughts test water systems. The 2012–2016 drought was broad and deep enough to test all water management sectors in California. Areas with the most severe impacts, in rough economic order, were agriculture (particularly San Joaquin Valley), forests, hydropower, rural groundwater supplies, recreation, the Sacramento-San Joaquin Delta, aquatic ecosystems, protected fisheries management, and cities (particularly hydraulically isolated cities). The state's water accounting and water rights administration systems were also tested.

The Sacramento–San Joaquin Delta is the major hub of California's water system and a continuing source of controversy. During the drought, low inflows from northern California greatly reduced the ability to move water from wetter northern California to drier southern regions and San Francisco Bay area cities. Water exports from the Delta were greatly reduced. In 2011, before the drought, Delta water exports peaked at 6.5 MAF, dropping to 1.8 MAF during the worst year of the drought. In May 2015, DWR installed a temporary rock barrier to close False River in the western Delta to reduce the need for additional freshwater outflow to San Francisco Bay to maintain low salinity in the central Delta. The barrier was removed in October 2015.

California supports 129 species of freshwater fish. Approximately two-thirds of these species are found only in California. Most of these species are either currently endangered or at risk of becoming endangered (Moyle et al. 2011; Hanak et al. 2015b). Low flows and high temperatures from the drought reduced water quality and impaired habitat for native fish species. Additionally, the drought's lower flows, longer water residence times, and higher temperatures supported expansions of some invasive species, particularly aquatic vegetation (Durand et al. 2018). Intervention by the State Water Resources Control Board required some to reduce surface-water diversions or groundwater pumping, which affects flows in some salmon and steelhead streams. However, the State Water Resources Control Board also temporarily voided at least 35 environmental flow regulations during the drought

Researchers address the impacts of the 2012-2016 drought on habitat and energy infrastructure in Los Angeles County. They utilized satellite data and the Normalized Difference Vegetation Index (NDVI) to examine temporal "browning," or a decrease in greenness due to drought. They determined areas and vegetation types with differing degrees of browning to assess the implications of climate change for local habitats and energy infrastructure. Remote sensing and Geographical Information Systems (GIS) were also incorporated to analyze relationships between the patterns of vegetation browning and various environmental factors (e.g. vegetation type, fire and landslide vulnerabilities, soil, and topography). The findings of the project will provide tools and metrics to preserve critical habitats while assisting utilities in siting energy infrastructure for enhanced disaster resilience.

Sao Paulo Water Crisis, Brazil (2014-2015)

In 2014, São Paulo nearly ran out of water. Schools closed, crops faltered and reservoirs were left at a tiny 5 percent of their capacity for the city and its surrounding population of 22 million. It was the worst drought in eight decades.

The dry season of 2018 raised fears of another water crisis. And in coming years, warming temperatures will heighten Brazil's water extremes, making both water scarcity and intense rainfall more common. Managing alternating droughts and floods alongside threats to water quality will be a challenge, one that the city's existing infrastructure isn't equipped to handle. São Paulo already loses over 20 percent of its treated water due to leaking pipes before it reaches the taps of its residents. A surprising and often overlooked solution can play a significant role in addressing these complicated threats. The forests surrounding São Paulo's main drinking water system filter water and help buffer against the impacts of droughts and floods, but over three-quarters of these forests have been degraded and destroyed. This means that the water utility brings in dirtier water, driving up treatment costs and diverting resources from other needs, such as fixing leaks.

The Cantareira Water Supply System sustains around half of São Paulo's metropolitan region. As its watershed is deforested and degraded, the Cantareira's reservoirs are increasingly inundated with sediment that muddies their waters and must be dredged out in order to make the water drinkable. The accumulating sediment wears down the treatment infrastructure, necessitating more frequent, expensive repairs. These costs add up: SABESP, São Paulo's water company, already spends about $22 million annually managing sediment pollution in the Cantareira. Root systems of healthy forests can manage sediment by holding soil in place, preventing erosion. SABESP, no stranger to these benefits, has planted over 1,000 hectares (about 2,500 acres) of trees on its property to reap the benefits of forests for water.

Looking beyond company fence lines, restoring trees further upstream would yield the greatest water benefits for São Paulo. Reforesting 2 percent of the watershed at random would reduce sediment pollution by only 8 percent. On the other hand, restoring 2 percent of São Paulo's forestland in priority areas, chosen using geospatial analysis, would generate a 28 percent return on investment over 30 years, by removing a third of sediment pollution, reducing turbidity by half, and slashing water treatment costs. Restoration of this scale would cost $37 million over 10 years, only about 1/6 per year of what SABESP is already spending on removing and treating sediment pollution.

For a city still reeling from drought, a steady water supply is of utmost importance in São Paulo. By filtering water, healthy forests will help ensure that reservoirs are filled with less sediment and more precious water. But the forests themselves can increase water supply, too. A forest's root system acts like a sponge, helping soils store water during wet seasons and releasing it during dry seasons when the city needs it most. Much is still unknown about the magnitude that this "sponge effect" has on Latin

America's waters, but the cloud forests around São Paulo seem to have a higher potential to raise the water supply. In cloud forests, leaves intercept fog, collect its moisture, and cause it to drip onto the ground below, which eventually makes its way to rivers and streams. Emerging science is beginning to find that cloud forests' ability to capture fog can sometimes be a primary source of water, especially in parts of the world with low rainfall.

The City of São Paulo is taking steps towards integrating natural infrastructure into urban strategy by becoming one of the 45 founding Cities4Forests. Through this new coalition, cities pledge to conserve and restore forests to provide their residents with benefits such as cleaner water and resilience to the impacts of climate change.

Cape Town Water Crisis, South Africa (2017-2018)

In a dry climate, with rapid urbanisation and relatively high per capita water consumption, Cape Town had all the makings of a water crisis. In 2018, after three years of poor rainfall, the city announced drastic action was needed to avoid running out. Reducing demand was a key priority. The City of Cape Town worked to get residents and businesses on board with a host of water-saving initiatives. People were instructed to shower for no longer than two minutes. A campaign with the slogan “If it’s yellow, let it mellow” promoted flushing the toilet only when necessary. And the use of recycled water, so-called greywater, was also pushed. At the most extreme, residents were restricted to a maximum of 50 litres a day, not easy when showers alone can use up to 15 litres a minute. Backed up with data on each household’s water use. During this Western Cape drought, 30% to 50% below average rainfall in a relatively large region from 35–31ºS and from 18–21ºE persisted for three years. The meteorological analysis of the event indicates that below-average total rainfall in the region was caused by a strong rainfall anomaly in the shoulder seasons, while the core of the rainy winter season was characterised by near-normal rainfall. While crucial for Cape Town, the reservoirs immediately surrounding the city are part of a larger system of water management in a wide Western Cape region which is well described by the rectangular box.

By changing a city’s habits, along with the welcome return of some rain, Cape Town managed to avert the worst of the water scarcity crisis. However, the risk of future shortages remains. South Africa is one of the world’s driest countries and demand for water continues to climb.

Chennai Water Crisis, India (2019)

In June 2019; the city woke up to the unfortunate news that all the main water reservoirs of the city had dried. This crisis came as a surprise because the city and its surroundings have been traditionally home to numerous water bodies and rivers along with a canal, making it a unique city with a wealth of water distribution channels and adequate drainage. Chennai has the potential to be a water-resilient city but instead is facing a water crisis.

In 2019, India's fourth most populous metropolitan area, Chennai experienced the worst drought in the city's history as the main reservoirs dried out. Over 10 million people inhabit the urban agglomeration, which includes peri-urban areas, towns, and villages. The figure shows the difference in the volume of water in one of the four main reservoirs of Chennai using satellite imagery.

The first image reflects the situation of the Puzhal Lake presence with water on May 28, 2018, whereas, in the second image, the lake is bone dry, nearly a year later, on June 19th, 2019. Is Chennai naturally a drought-prone city? Chennai is not a rainfall-deficient city and despite several warnings in the previous years, Chennai ran out of water. Thus, raising an eyebrow on the approach of the water management system and urban water governance. Urban water governance refers to the interaction between stakeholders and actors consisting of governments, the private sector, international agencies, and civil societies, that are involved in socio and political confrontations around how water resources and services should be governed, by whom, and for whom (Miranda, Hordijk and Molina 2011). It is critical to understand that urban nature is not given but socially produced. Consequently, a critical perspective is required to question whether scarcity is only attributed to climate change, or could such disaster be human-induced or 'manufactured.' A perspective to make the connection between the ecology of water and political influence is necessary. The study hypothesises that the problem lies when the extreme water crisis is perceived to be more of an environmental cause (unpredictable weather patterns and brought on by climate change) than that of mismanagement of water resources (shrinking groundwater levels caused by years of unregulated use). Consequently, while the entire city experiences water shortage, events like droughts often impact the citizens differently.

In 2003, the state government did take action. Lawmakers passed the Tamil Nadu Groundwater Development and Management Act. It sought to regulate the numbers and locations of private bore wells by requiring landowners to apply for permits before drilling. It also mandated rainwater harvesting at all buildings. But the law was never really enforced and was repealed by an ordinance in 2013. The government has promised new legislation to replace it, but six years on, nothing has been passed. In advance of that 2003 law, Tamil Nadu also commissioned Chennai's Rain Centre, a nonprofit organisation inaugurated by the then-chief minister, to teach people how to harvest rain. But 16 years ago, when the state government first required residents to "catch rain," Raghavan says it was a tough sell. Not many people were willing to invest in drain pipes and tanks. The government took measures to recharge groundwater. So, it was made mandatory for the residents to harvest rainwater. This played a crucial role in combating water scarcity.

4. Involved Countries and Organisations

a. COUNTRIES

Argentina: The water governance system in Argentina is highly decentralized. The 23 provinces and the city of Buenos Aires have jurisdiction over water resources, including for inter-jurisdictional rivers, and are responsible for the provision of water services within their boundaries. Their powers include policy making, policy implementation, operational management, financing, and regulation of both subsectors. For the specific case of the Metropolitan Area of Buenos Aires, the national government together with the city of Buenos Aires and the province of Buenos Aires are responsible for the provision of water services. In practice, the national government can establish a national water policy, strategy, program or plan, but needs the acceptance and support of the provinces to implement it, even within the Metropolitan Area of Buenos Aires.

Australia: Australia faces major challenges to ensure a sustainable water supply for agriculture, the environment, and communities in the face of climate variability, water scarcity, and growing demand for water. Agencies at different levels of government have a role in the management of their water resources. State and territory governments are primarily responsible for managing water within their jurisdictions. The Australian Government provides national coordination and leadership to drive policy and law reforms to manage their water resources sustainably and productively for future generations of Australians. To drive water reform, they collaborate and consult with state and territory governments, other Australian Government agencies with an interest in water management, scientists, councils and committees of experts, and communities.

Australia also engages in multilateral discussions on international water policy issues, sharing their knowledge and experiences of sustainable water management for all water users and the environment. Their water policies improve the sustainable management of Australia's water resources and increase water security for communities, agriculture, and the environment so they have a reliable supply of water into the future.

Brazil: In Brazil, the protection, preservation, and management of water resources are part of the environmental policy. The Brazilian federal law on water resources, Law no. 9.433 of 1997 (the National Policy for Water Resources) states that water is a public good, limited and of multiple uses. In the country, the multiple uses of water are basically: human. consumption, watering livestock, industrial, power generation, irrigation, sanitation, and waterway transport. These uses change from basin to basin, depending on the characteristics of each one of them. The Water Resources Law states that water

use for human supply and for watering animals is a priority, necessarily in that order, in all basins in the country.

The implementation of the National Policy for Water Resources is carried out in a decentralised manner, as a partnership between the federal government and state governments, in accordance with the character of the basin (national or subnational) through the National Water Resources Management System (SINGREH). A basin can be classified as national or subnational, according to the criteria defined by federal law. Water resources that neighbour other countries, that derive from other countries, or that are part of the territory of more than one federative unit are classified as national, Basins are considered subnational if they are restricted to the territory of a federative unit.

Canada: When it comes to water governance in Canada, the federal government has jurisdiction related to fisheries, navigation, federal lands, and international relations, including responsibilities related to the management of boundary waters shared with the United States, including relations with the International Joint Commission. It also has significant responsibilities for agriculture, health and the environment, and plays a significant role supporting aquatic research and technology, and ensuring national policies and standards are in place on environmental and health-related issues.

To fully understand the federal government's role in water management in Canada, it is important to first understand the interests and mandates of the departments involved in program delivery. Within the federal government, over 20 departments and agencies have unique responsibilities for fresh water. As all levels of government hold key policy and regulatory levers which apply to water management, a central challenge is to ensure that these levers are developed and used collaboratively. Environment and Climate Change Canada works closely with other federal departments to develop a more strategic approach to addressing nationally significant freshwater issues.

Chile: Chile adopted the National Water Resources Strategy in March 2013 (that updates the National Policy on Water of 1999). The Water Code (1981) establishes that water is national property for public use, and in 2010, the government recognized the access to safe and clean drinking water as a human right. Chile has increased its public disbursements on water resources policy and administrative management due to: major water resources public investment; more investment projects (monitoring and follow up); new institutions Q(environment); the need for regulations; better monitoring of water withdrawal, icecaps and water bodies.

China: Water Law of the People's Republic of China states that water resources shall be owned by the state. The State Council shall exercise ownership of water resources on behalf of the state. Water in the ponds of rural collective economic

organisations and in the reservoirs constructed and managed by rural collective economic organisations shall be used by those organisations. The state shall protect water resources and adopt effective measures to preserve vegetation, plant trees, grow grass, conserve water sources, prevent and control soil erosion and water pollution, and improve the ecological environment.The state shall formulate the strategic plan for water resources of the whole country. Watershed plans include comprehensive watershed plans and special watershed plans; region plans include comprehensive region plans and special region plans. Construction of a water project must be in conformity with the comprehensive watershed plan. The construction entity shall obtain the written consent before commencing the construction of a water project on an important river or lake. The development and utilisation of water resources shall first satisfy the needs of the urban and rural inhabitants in their domestic use of water and give overall consideration to the agricultural, industrial and ecological need for water as well as to the needs of navigation. In dry and semi-dry areas, the development and utilisation of water resources shall take into full consideration the ecological environment's need for water. The Law further provides for groundwater overdraft measures to control mining of groundwater, protection of safe drinking water areas, prohibition on waste or refuse into rivers, etc.

Denmark: According to Nature and Environmental 2003, Water in Denmark, clean water ranks highly on the Danish Government's environmental policy agenda. Danish measures are targeted and focused, in line with the EU Water Framework Directive (WFD), on areas where nature and the environment are in need. With the implementation of the EU WFD, a number of new environmental targets for groundwater must be introduced in Danish law. When setting the targets, the entire hydrological cycle, i.e. the impact of groundwater on other parts of the hydrological cycle, is considered. For instance, the magnitude of the impact on surface water in watercourses and lakes should not prevent compliance with the environmental targets set for groundwater.

Egypt: In common with current global thinking on how to solve present water resources problems, Egypt has adopted an Integrated Water Resources Management (wRrM) approach. IaM is defined as a process which promotes the coordinated development and management of water, land and related resources, in order to maximise the resulting economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. iwRM is based on several principles. Implementation of these principles is situation and culture dependent. In the context of Egyptian water management the following principles are in particular important:

1. Fresh water is a finite and vulnerable resource, essential to sustain life. development and environment; it should be considered in a holistic way, simultaneously taking into account quantity and quality, surface water and groundwater; and

2. Water development and management should be based on a participatory approach involving users, planners and policy-makers at all levels

Adopting an IWRM approach means that this National Water Resources Plan is oriented towards the socio-economic development goals of Egypt and, besides direct water needs, addresses issues such as health, employment and general well-being of the people. Representatives of relevant stakeholders have been involved in developing this plan, both at a horizontal level (the various ministries involved) as well as vertically (governorates, water boards, various user groups, etc.).

France: The French policy concerning the right to water is that everyone should have access to drinking water and sanitation and that water service should be paid entirely by users. The water law of 1992 states that water is part of the common heritage of the nation and that its use is for all. This was amended in 2006 in the new water law (loi sur l'eau et les milieux aquatiques n°2006-1772 du 30 décembre 2006, LEMA) of which article 1 states: "(Within laws, regulations and established rights, the use of water is for all and every physical person has the right of access to drinking water for nutrition and hygiene at affordable price.". This right to water for all is limited to a small quantity of good quality water at a price that each person is able to pay. In France the "right to water" has been a legally recognized individual right since December 2006. It is closely linked with the right to a decent housing (a legally enforceable right since March 2007) and to the right to a decent life. Everyone has the right to be connected to nearby water supply networks if available and everyone has the right and even the obligation to be connected to nearby sanitation networks if available. But that does not mean that everyone is supplied with drinking water at home nor has access to a sewer.

Germany: Regulatory law stipulates that water bodies in Germany are subject to state management. Citizens and authorities are obliged to use water responsibly. The most important federal law is the Federal Water Act (Wasserhaushaltsgesetz, WHG, in German), originally adopted in 1957. A substantially revised version entered into force in March 2010. This amendment completed the transposition of the EU Water Framework Directive (WFD) into German national law and allowed the German Länder to adapt their respective water acts to the European provisions. The amendment created the legal basis for transboundary, sustainable water management. The goal is to achieve good status for all water bodies by 2027 at the latest, not just in terms of pollutant levels but also with regard to the status of native aquatic animal and plant species. To this end, management plans must be drawn up. To coordinate this process, river basin communities have been established among the Länder sharing joint responsibility for the catchment areas of large rivers.

Greenland: The Regulation No:10 sets rules on public and private water supply to consumers and businesses and applies to all water trading companies. The document ensures that guidelines are followed with regard to the urban planning of water supply. Such guidelines are regulated by the Government of Greenland, responsible for the administration of the Greenlandic Self-Government (fees, and estimation thereof to apply to commercial suppliers).

India: Water being a State subject, steps for augmentation, conservation and efficient management of water resources are primarily undertaken by the respective State Governments. In order to supplement the efforts of the State Governments, the Central Government provides technical and financial assistance to them through various schemes and programmes. Government of India in partnership with States, is implementing JalJeevan Mission (JJM) – HarGharJal which aims at providing potable water in adequate quantity of prescribed quality on regular and long-term basis to every rural household, through tap water connection, by 2024 with an estimated outlay of Rs.3.60 lakh crore. The water sources which inter alia include groundwater, surface water (river, reservoir, lake, pond, springs, etc.) and rain water stored in small tanks are being used as sources for drinking water supply schemes. Government of India launched Atal Mission for Rejuvenation & Urban Transformation (AMRUT) as a water focused national urban mission in 2015 with an aim to achieve universal coverage of water supply in 500 Mission cities for five years which is extended till march 2023 for completion of projects. At the inception of AMRUT, the water supply coverage was 64% and by the end of the Mission it aims to cover 100% households. The target is to provide 139 lakh water tap connections to achieve universal coverage. So far 115 lakh new water tap connections have been provided under AMRUT, in convergence with other schemes.

Indonesia: The central government mandates local governments to provide 100% access to drinking water for the community. To support the achievement of these targets the Government issued regulations which serve as a guide for local governments. The central government also facilitates the preparation of cooperation agreements on the supply of drinking water. Most recently. The Government issued the white paper ("Buku Putih"), as a reference for technical implementation of drinking water supply in the regions. In addition, the regional government has compiled the Rencana Induk Sistem Penyediaan Air Minum (RISPAM / water system master plan document) which is a piped water network' planning document and contains the main components of the system and its dimensions. RISPAM is prepared by taking into account:

1. Water resources management plan
2. Regional spatial planning, water system policy and implementation strategy

3. Environmental, social, economic, and cultural conditions of the people in the local area and surrounding areas

4. Area conditions and development plans.

Iran: According to Iran's water legislation, three ministries are directly responsible for water resources assessment and development:

1. The Ministry of Energy (MoE): MoE was established in 1936 to provide electricity for the country. In 1943, the ministry's duties expanded to include water management. MoE was named the Ministry of Water and Electricity before it was renamed as the Ministry of Energy in 1975. MoE has two responsibilities: energy supply, and water and wastewater services.As far as irrigation is concerned, it is in charge of the construction of large hydraulic works, including dams as well as primary and secondary irrigation and drainage canals for the distribution of water. Within the MoE, the Deputyship for Water Affairs is responsible for overseeing and coordinating the planning, development, management and conservation of water resources. This deputyship consists of the following sections: Water Resources Management Company (WRMC), Provincial Water Authorities (PWA), Irrigation and Drainage Operation and Maintenance Companies (O&M). WRMC is the mother company that manages all water sectors within the MoE, except drinking water distribution for rural and urban areas. PWAs are responsible for the water sector, including irrigation and drainage development and operation, in each province. Drinking water distribution is the responsibility of provincial water and wastewater companies. O&M companies are responsible for modern irrigation and drainage operation and maintenance. Forty-nine per cent of the shares of these companies is held by the MoE and 51% is held by the private sector. There are 19 O&M companies working under the supervision of the PWAs.

2. The Ministry of Agriculture (MoA): Is responsible for supervising rain-fed and irrigated crop development. Whereas the MoE is in charge of water management from the river source up to the level of secondary irrigation canals, the MoA is in charge of subsurface drains, tertiary and quaternary canals as well as farm development and irrigation techniques, planned and operated by the Provincial Agricultural Organizations and the Deputy Ministry for Infrastructure Affairs of the Ministry of Agriculture.

3. The Department of the Environment (DoE): Is responsible for drafting environmental protection policies and the laws, directives and systems necessary for evaluating the environmental impacts of social and

economic development projects, particularly irrigation and hydropower projects, and monitoring their implementation.

Israel: To provide its rapidly growing economy with sufficient and reliable water, Israel has combined institutional and regulatory reforms with massive infrastructure investment. Large-scale reuse of wastewater and desalination of seawater, along with effective regulatory and price signals, have allowed Israel to gradually reduce overexploitation of freshwater resources. The 2012 National Long-term Master Plan for the Water Sector through 2050 is at the heart of this process. The plan defined Israel's vision, goals and objectives of the national water sector, as well as policies on major water issues. It provides a medium- and long-term forecast for the balance of water resources in the country with a view to anticipating future water challenges and addressing climatic uncertainty.

A national bulk water conveyance system allows for optimisation of water distribution from various sources depending on demand. Massive public awareness campaigns have emphasised the value of water. Quasi-universal water metering allows for strict enforcement of water abstraction quotas. Israel has built a sophisticated infrastructure network that can efficiently transport the water from north to south and from east to west, with a low-to-zero-water leakage rate. Climate change forced the country to further adapt to extreme weather events. In 2018, the government adopted a strategic plan for coping with periods of drought for 2018-30. The main measures include increasing supply of desalinated water, reducing demand and encouraging water conservation, and reinforcing protection of Lake Kinneret. The Water Authority notably imposed permanent cuts in agricultural water quotas of up to 41% for irrigators accessing the national water system. Farmers could voluntarily waive part of the quota in exchange for support. Moreover, to increase the resilience of natural systems, the Israel Nature and Parks Authority, the Ministry of Environmental Protection and the Water Authority jointly issued in 2013 a Master Plan for the Supply of Water to Nature. An inter-ministerial team prepared river plans to see how much water is needed for individual ecosystems. Approved plans exist for several major rivers. They determine how much water to discharge, what type and when. In some places, they set aside a minimum quota of water for ecosystems. A manual describes the bodies and institutional and regulatory framework involved in preparing water plans.

Italy: Water supply in Italy covers 96% of the population, while the sewage system covers 84% and the wastewater treatment covers 75% of the "equivalent inhabitants". A radical reform was introduced in 1994, with the goal to exploit the economies of scale and of scope existing in the sector. It prescribed that supply, collection, and treatment are unified in an "integrated water service", to be managed on a large territorial basis by a unique firm. Consumers must bear all the costs. Because of the relevant investment needed, the average tariff is

forecasted to increase in the next fifteen years, but the negative social impact should be avoided through an appropriate tariff discrimination. The reform was strongly opposed by local governments, which were before responsible for water services. Now it covers the majority of the territory but some difficulties remain, since local governments are against the choice of the managing firm by auction and they prefer to directly assign the service to a public firm.

Japan: In Japan, the national government is responsible for formulating and implementing water resources policies at the national level. It formulates an overall plan of water resources development and environmental conservation. The Comprehensive National Water Resources Plan is the national basic plan for water resources development under which dams and water systems are developed. The Basic Environment Plan clarifies long-term and comprehensive environmental policies related to water quality and quantity, including water conservation.

Lebanon: The Lebanese water sector suffers from chronic mismanagement that has hindered the provision of reliable water supply and sanitation services since the end of the civil war in 7990. The adoption of the National Water Sector Strategy and the National Strategy for the Wastewater Sector in 2072 by the Lebanese Council of Ministers, followed by the promulgation of the Water Code in 2078 and its amendment in 2020, were expected to improve the situation by reducing prevailing overlaps and inefficiencies within the sector. However, persistent challenges over the past 10 years have forced the Ministry of Energy and Water to focus on continuous emergency response. Furthermore, the current national economic crisis in the country is preventing any progress in this sector. Local governments are taking initiatives to fill the prevailing gaps, encouraged by funding and empowerment by the international donor community.

Libya: Libya experiences critical water stress and a recent study by Water Resources Institute (WRI) in 2019 ranked Libya as sixth most water stressed country globally. Projections to 2040 suggest water stress will increase threatening national water security and economic growth. According to Global Facility for Disaster Reduction and Recovery (GFDRR), water scarcity is classified as high level of hazard for the whole country, with droughts expected to occur every 5 years (GFDRR, 2021). Libya has a total renewable water resource per capita of the equivalent of 287 litres per person/ per capita /per day (lpcd), decreasing 11% between 2007-18, and has no dependency on renewable water resources from outside its territory. According to the World Health Organization (WHO), between 50 and 100 litres of water per person/per day is considered as the essential level to ensure that most basic needs are met, and few health concerns arise. Libya has relatively high-water consumption per capita (2,392 lpcd) when compared to MENA and global levels of 889 and 784 lpcd respectively. The majority of extractions being unsustainable from

groundwater sources (79%). Agricultural consumptions account for 83.1% of total freshwater resources (FAO, 2022). Municipal consumptions vary greatly amongst cities and regions ranging from an average of 415 lpcd (VNR, 2020), with domestic water demand expected to increase by 39.5% between 2010 and 2030.

Morocco: Morocco has experienced annual rain deficits since 2015 causing weak runoffs, a reduction in water supply to dams, and diminished recharge of groundwater. In regions where the demand relies exclusively on local supply systems, successive drought years have caused chronic shortages. According to the World Resources Institute (WRI), Morocco ranked 22nd among countries most at-risk of water shortage. Morocco's water per capita is currently 606 m3 instead of 2,560m3 in the 1960's, according to Minister of Infrastructure and Water Nizar Baraka. This ratio is expected to decline to 500m3/capita/year by 2030. The General Directorate of Water, within the Ministry of Equipment and Water determines governmental priorities and invests in large infrastructure projects within the sector like dams, pipelines, and canal systems. ONEE (the National Office of Electricity and Water) is the national water and electricity utility, and the company that invests in major strategic and structural projects for potable water and wastewater. A state-owned company, ONEE also commonly administers public tenders for the sector. In addition to ONEE's role in the water sector, private companies in Rabat, Casablanca, and Tangier are responsible for potable water delivery and distribution. To rebuild and restore water availability across the country, Morocco implemented a "National Water Plan" (PNE) in 2020, setting out an ambitious action plan to invest nearly $40 billion into the water sector. Last May, King Mohammed VI issued instructions to allocate an additional budget in support of the National Program for Drinking Water Supply and Irrigation 2020-2027 (a subset of the National Water Plan)

Netherlands: In the Netherlands, the protection of groundwater intended for drinking water production is set out in the Environmental Management Act. Provinces can designate groundwater protection areas around drinking water extraction points and have done so for nearly all groundwater extraction points in the Netherlands. Within a groundwater protection area, provinces impose additional requirements on the use of crop protection products, for example, or on conducting certain activities. Surface water extractions are protected by environmental quality requirements which are set out in the Water Quality Requirements and Monitoring Decree (BKMW, 2009).

When the WFD came into force, it became clear that the Netherlands has sufficient legislative instruments to protect its drinking water sources, but those instruments were not being sufficiently implemented in practice at that time to achieve the objectives of the WFD (cf. Buitenkamp Van den Brink, and the flood risk management plans in SGBP 2008). A number of bottlenecks in the implementation became apparent, including the following:

1. There are many different parties involved in the protective efforts,
2. There is no shared overview of the risks involved, and therefore no comprehensive awareness of any need to take measures,
3. Protection of drinking water sources has not been embedded in spatial planning policy,
4. There is no central management in creating policies for protecting drinking water sources.

For that reason, nationwide agreements have been made to create regional dossiers on extraction points for public drinking water. In a regional dossier for an extraction point, the stakeholders (municipal authorities, provincial authorities, drinking water companies, and water board) identify current and future risks that could affect water quality. These risks could be related to physical factors that affect drinking water, or to policy related to these aspects. The regional dossiers will also include potential measures that have been identified for future attention, which the parties need to reach an agreement on at a subsequent stage. As the dossiers are being compiled, risks and measures that are more appropriately addressed at a regional or national scale will also become apparent. Responsibility for compiling the regional dossiers for groundwater extraction has been assigned to the provincial authorities, while the water boards are responsible for the regional dossiers for surface water extraction. The available regional dossiers were evaluated in 2014. Based on these results, a new protocol for creating regional dossiers and implementation programmes was drawn up by the stakeholders in 2016.

New Zealand: Durable water policy to support the sensible use of water requires an in-depth understanding of the characteristics of the water system within New Zealand and the policy challenges it presents. The main problem with New Zealand water policy is uncertainty. The uncertainty is driven by increased competition for water, a lack of understanding of society's preferences about how we use and value water, a lack of scientific information about water and inertia on the part of users and institutions. The challenges facing water management in New Zealand are nuanced:

1. There is significant variation of water quantity issues by catchments – scarcity and quality are not an issue across all of New Zealand all of the time.
2. Most regions have at least one river (surface water) or aquifer (groundwater) that is either fully or over-allocated, or likely to become so in the next one to five years
3. 39% of groundwater sites and 44% of lakes have nutrient levels above natural levels. However, they are not bad by international standards

4. The full impacts of past and present water uses on water quality have yet to fully materialise

5. The growth of agricultural (mainly dairying) and urbanisation are the main sources of water quantity and quality problems, and they are expected to continue.

The main consequence of falling water availability is increasing competition for water between different users and deteriorating water quality in some catchments. New Zealand has had little consistent water policy over time. The ad-hoc responses of the 1840 – 1930s were replaced with an interventionist approach for the period from 1941 – 1989. Since then, the Resource Management Act (RMA) has given regional councils the responsibility of managing the complex trade-offs associated with water management. The weaknesses of the current RMA system are well known, and have become clearer as water scarcity and quality issues have become more prevalent. The first-in, first-served mechanism is inefficient for allocating water; the lack of flexibility restricts improvements to water allocation, and there are large gaps in information and data.

Nigeria: The National Water Resources Policy aims to facilitate and enhance sustainable access to safe and sufficient water to meet the cultural and socioeconomic needs of all Nigerians in a way that will enhance public health, food security and poverty reduction, while maintaining the integrity of fresh water ecosystems of the nation. It seeks to eradicate water-borne diseases, poverty reduction and institutionalising integrated and sustainable water resources management to meet the nation's present and future water resources needs in all demand sectors, including human consumption, animal husbandry, agriculture, hydropower, inland waterways and industry while protecting the environment. The policy builds on the existing National Water Resources and Environmental Management Strategy (WREMS), which urges all stakeholders to ensure integrated management and development of water resources in the country. The specific objectives of the Water Resources Policy are to:

1. Optimise the use of nation's water resources at all times, for the present generation without compromising the existence of the future generations

2. Foster Integrated Water Resources Management

3. Manage the water resources for the purpose of eradicating poverty while enhancing and improving public health

4. Improve and expand the delivery of water services in an equitable manner

5. Foster the conservation of water and increase systems efficiencies

6. Rainwater management with sustainable drainage as a method of household water supply, drainage and flood control
7. Prevent the over-exploitation of groundwater and protect its quality
8. Promote national and international cooperation and increase the mutually beneficial use of shared water resources within Nigeria and with its neighbouring countries
9. Facilitate the exchange of water sector information and experience
10. Conserve the quality of both surface and groundwater resources while promoting the protection of the environment and associated aquatic ecosystems to ensure long term sustainability
11. Develop dams as a means of mitigating flood and erosion
12. Mitigate the impacts of climate change especially on desertification, flooding, coastal inundation and rapid drying up of lakes and rivers.

North Korea: To ensure steady sources of water, North Korea has constructed numerous reservoirs at higher elevations, capturing snowmelt and water runoff during the rainy season. As water is gradually released from these reservoirs, it feeds into streams and rivers down to the lowlands, where water is diverted into crop fields via a network of canals and pumping stations. There are approximately 20 of these canal waterway networks of differing lengths. The majority of these waterways are located in the west and southwest provinces, while a handful are principally tunnel waterways located in the higher elevations of the north and northeast of the country. The latter originate from mountain reservoirs in the west, thus indirectly supporting the network of waterways there. Others flow to the east, feeding into other reservoirs or directly into rivers from which water is drawn for irrigation of the smaller crop fields located along the east coast. The latter rivers tend to dry up during the dry seasons. The tunnel waterways are intended to provide a more constant supply of water to meet agricultural needs. The use of pumping stations, however, brings about an additional challenge, namely, a lack of consistent electricity supply. In a creative effort to ease this challenge, North Korea has undertaken an effort to utilise more “gravity-fed” waterways to channel water to the agricultural regions, reducing the need for electrical equipment. The largest of these efforts began in South Hwanghae Province in January 2012 and was completed in May 2020. According to state media, this is “the largest gravity-fed irrigation network,” spanning “well over a hundred kilometres” and able to “supply enough irrigation water to tens of thousands of hectares of farmland.” Coverage of this project emphasised that this network uses minimal electric power and pumping equipment while still being able to supply enough irrigation water to ensure stable yields, prevent drought and flooding, develop fish farming, and

"provide people with a pleasant cultural recreation environment." While the initiative in South Hwanghae Province is touted as the largest of these systems, most recently, North Korean attention has turned to the Hwangju Kindung Waterway, located approximately 35 kilometres south of Pyongyang.

Norway: Norway has many rivers and waterfalls. This abundance of water, suggest that supply is more than adequate for domestic, agricultural and industrial uses in almost all parts of the country and at all times. These are very important to both commercial interests and community purposes such as outdoor recreation. Use of water resources for agriculture is a central issue. Agriculture occupies a special position for the use of river systems. Important applications include irrigation and drinking water, property boundaries and natural barriers for livestock. The main policy governing the use of fresh water resources is the Water Resources Act in 2000. This Act came into effect in January 2001 and is related to river systems and ground water. The Act intends to ensure the river systems and groundwater are managed in accordance with the interests of the community. It is resource-oriented and it takes a balanced view between natural resources and users. The main objectives of the Water Resources Act are to promote sustainable development and to maintain biological diversity and natural processes in river systems. The Act also introduces a licensing system, which is for the measures subject to the legislation on water resources. The requirement to obtain a licence pursuant to this Act applies to all types of works which might cause significant damage or nuisance to community interests. Licences were generally only needed for hydropower development. However in recent years, this requirement has been interpreted more widely, so that other works which involve possible damage or nuisance, such as major water supply, drainage projects and the abstraction of water for fish farm, have also become subject to the licensing process. To conclude, nobody can initiate works in watercourses that may cause any significant damage or inconvenience to public interests or in the sea without obtaining a licence.

Pakistan: Pakistan is rapidly becoming a "water scarce" country. The Policy seeks to respond to this water crisis. It reaffirms the right of all citizens of Pakistan to equal and affordable access to clean drinking water and appropriate sanitation facilities. Irrigated agriculture is the backbone of the country's economy, and consumes around 95 percent of the nation's water resources, the balance is used for domestic and industrial requirements. Pakistan is heading towards a situation of water shortage, which poses, among other things, a threat to food security. Another threat is floods caused by Glacial Lake Outburst Floods (GLOF). The objective of the National Water Policy is to take cognizance of the emerging water crisis and provide an overall policy framework and guidelines for a comprehensive plan of action. The Policy is a national framework within which the provinces can develop their master plans

for sustainable development and management of water resources. The water resource is a national responsibility but irrigation and agriculture, as well as rural and urban water supply, environment and other water-related subsectors are provincial subjects. The Policy specifies the main concerns of the water sector. These include, among other things, demand-supply of freshwater, maintenance of waterworks, existing and planned trans-boundary developments, salt balances, depletion of groundwater resources, water wastage, institutional framework, and low irrigation efficiency. Policy objective include, among other things, sustainable consumption and production patterns throughout the water sector, improving availability, reliability and quality of freshwater resources and water management, improving watershed management through extensive soil conservation, catchment area treatment, preservation of forests and increasing forest cover, drought management with emphasis on long-term vulnerability reduction, better regulation of groundwater abstraction, measures for the long-term sustainability of irrigation systems, strengthening of awareness and capacity building, protection of wetlands and Ramsar Sites for the prevention of wildlife, flora, and fauna, measures to reduce or prevent saltwater intrusion, climate change impact assessment and adaptation for sustainable water resources development and management, and setting major national targets for the water sector including those for water conservation, water storage, Irrigation, water treatment, and drinking water. These targets can be firmed up in consultation with the Provincial Governments and reviewed periodically for inclusion in the 12th and 13th Five Year Plans and future plans.

Qatar: The country reports that the proportion of the population with access to clean and safe drinking water and sanitation was 96.2% and 96%, respectively in 2017. The natural resource challenges are posed by the scarcity of irrigation water and arable land, which amounts to 65 thousand hectares, equivalent to 5.6% of total area of the State. The arid climate, the high temperatures and the increasing salinity and scarcity of groundwater pose major challenges to the food production system. The planned expansion of local food production will put pressures on the limited natural resources through overfishing and depleting the groundwater, unless unconventional practices are followed in food production, such as hydroponics, greenhouse construction, and the use of advanced technologies in agriculture, livestock and fish production. Given the availability of safe water and safe sanitation, as well as the availability of cleaning materials for all residents in the State of Qatar, there were no deaths attributed to unsafe water, unsafe sanitation and lack of hygiene throughout the period (2016 -2019). In the field of water consumption and management, Qatar aims to reduce the loss of drinking water rate to 8% by 2022, minimize groundwater depletion and develop the groundwater aquifer by 2020, and reduce per capita water consumption by 15%.

Russian Federation: Water Legislation of the Russian Federation regulates relations in the utilisation and protection of bodies of water/water relations. The provisions of this Code regard also internal seawaters and territorial sea of the Russian Federation. Water legislation of the Russian Federation shall regulate relations in the utilisation and protection of bodies of water with the object of ensuring the rights of citizens to pure water and a favourable water environment; maintaining optimal conditions for the use of water, and the quality of surface and subsurface waters in a state meeting sanitary and ecological requirements; protecting bodies of water from pollution, clogging and depletion; preventing or liquidating harmful effect of waters, and maintaining the biological diversity of water ecosystems. Article 8 classifies the types of water bodies, depending on physical, geographic, hydro-regime and other features, as follows:
1) surface bodies of water
2) internal sea waters
3) territorial sea of the Russian Federation
4) subsurface bodies of water.
Article 34 classifies the forms of ownership of water bodies as state ownership on one hand and municipal and private ownership on the other that shall be allowed only of detached bodies of water. Article 85 classifies the purposes and ways of utilisation of water bodies as:
1) drinking, everyday and household water supply
2) public health care
3) power and other industries
4) agriculture
5) forestry
6) hydropower industry
7) recreation
8) fishing industry
9) hunting industry
10) timber rafting
11) extraction of minerals, peat and sapropel
12) other purposes.
Utilization of bodies of water may be effected with the withdrawal of water resources (intake of water) or without withdrawal of water resources (drainage, utilization as waterways, and the like).

Saudi Arabia: Saudi Arabia has obvious water resource challenges. It also has a plan to sustainably address these issues and is a global leader in this regard. At the G20 hosted by the Kingdom in November 2020 the organisation agreed, for the first time, to embed flexible and sustainable water management as part of its future plans and to enhance cooperation on water issues between G20 members and the rest of the world. Ensuring availability

and sustainable management of water and sanitation is also one of the seventeen United Nations Sustainable Development Goals (SDGs). The Intended Nationally Determined Contribution (INDC) of Saudi Arabia under the United Nations Framework Convention on Climate Change (UNFCCC) recognised these challenges in November 2015. Under the Saudi INDC two development baseline scenarios were identified – one reliant on heavy industrialization; the other envisaging economic diversification with a robust contribution from oil and its derivatives with revenues channelled into investments in high value-added sectors such as financial services, medical services, tourism, education, renewable energy and energy efficiency technologies to enhance economic growth. The Kingdom's Vision 2030 programme has since then turbo-charged the latter economic diversification agenda. Since its promotion in 2016 a wide range of legal measures have been adopted which underpin these aspirations. In particular, we look at new Water and Privatization Laws and some tangential sources which are also relevant. Each of these new laws are, to some extent, a work-in-progress, with implementing regulations and ancillary documentation yet to be widely available. However, they provide a strong indication for the direction of travel as regards water assets and services. They will need to be assessed by international investors as an ensemble, the regulatory regimes envisaged remain to be fully articulated and will be iterative upon each other (and other sources of law). How these laws harmonise in the context of a whole-country water regime is crucial but remains to be tested. Investors will need to understand the intricacies of these interlocking regulatory frameworks and have a sound appreciation of the basis of Saudi law, the Sharia'h. As a starting point, it is important to note that the Privatization Law introduces a definition for "PPP." This usage applies to any contractual arrangement relating to infrastructure or a public service containing the following elements:

1)A term of five years or more
2)A private sector party performing two or more of: asset design, construction, administration, operation, maintenance or funding, whether such asset is owned by the government, the private sector party or both
3)A risk matrix allocating risks between the parties
4)A financial return of the private sector party based primarily on performance levels.

Many water infrastructure projects will fall under this definition and, accordingly, two (at least) interlocking regimes will apply. Water has long been a priority for private sector participation in the Kingdom and is included in the Vision 2030 Privatisation Program promoted by the National Center for Privatization (NCP), along with (*inter alia*) agriculture, environment, education, housing, public transportation, *hajj/umra*, and natural resources.

South Africa: South African National Water Policy Review provides the key policy positions to address oversight and gaps in the current water policy, with specific emphasis on addressing water equity and redress. It has as its main focus the principle that water is shared on an equitable basis, so that the needs of those without access to water in their daily lives are met, the productive use of water in South Africa's economy is encouraged, and the environment is protected. This Policy will indicate the way forward in legal reform of the water sector and provides positions to support current and future national actions or imperatives to address some of the most pressing issues in the water sector. It provides mechanisms to support the national strategic objectives and imperatives outlined in the second edition of National Water Resource Strategy (NWRS2). It does not replace earlier water policy, but rather provides amendments to address omissions or gaps in these original policies, while reaffirming key water principles in the country. The policy positions in earlier water policies, which are not recommended for amendment in this Document, thus remain valid. The policy positions contained in this Document were concluded in consultation with the public and stakeholders. There are currently four policy documents that underpin the legislation administered by the Minister: White Paper on Water Supply and Sanitation (1994), White Paper on a National Water Policy for South Africa (1997), White Paper on Basic Household Sanitation (2001) and the Strategic Framework for Water Services (2003). Since the promulgation of these policy documents, and based on several years of implementation of policy, a number of challenges and unintended interpretations have been identified that require a policy review, and consequent legislative amendment. Also the management of the entire water value chain will be reshaped. It is recommended that the Minister be accorded the mandate to develop a National Water Strategy that deals with both water resources management and water supply and sanitation services, and that a key part of this proposed policy includes the development of an infrastructure investment strategy for both water resources and water supply and sanitation services infrastructure. This Policy Review will be used to inform a revised National Water Bill, which will bring the National Water Act (NWA) and the Water Services Act into one Act, as was originally intended. The main body of the Policy review concentrates on equitable Water resources, which have to be managed in each catchment to ensure that the demands of all users are met sustainability, efficiently and equitably, as mandated by the NWA. Consumptive and productive use of water interacts with the water resource primarily at the points of abstraction from and discharge/return flow to the resource. Main issues of protection, use, development, conservation, management and control of water resources, as required by the NWA are specified. As for water use policy positions are laid down for authorised water use, water trading between authorised water users, social and economic equity in the reallocation of water, a multiple water-use approach and a participatory planning approach, access to basic water supply

and free supply for certain households. Roles and responsibilities of water institutions are outlined. Institutions involved are the Department of Water and Sanitation (DWS), Water Boards, Catchment Management Agencies, Water User Associations, Irrigation Boards, Water Services Authorities, and Water Services Providers. The functions and powers of these institutions are reconsidered. Economic regulation (basically a water charge system) will be applied throughout the water value chain. To avoid any conflict of interest, real or perceived, water use tariffs will be determine annually by DWS, in consultation with National Treasury. Regional Water Utilities will be established. The functions of the Regional Water Utility will be to plan, build, operate, support and maintain Regional Bulk Infrastructure.

South Korea: The Korean government has enacted a law in 2010 to promote wastewater reuse so that treated wastewater could be used as water resource. With the development of technology and solutions, the use of wastewater, such as supplying high quality industrial water, has been increased. It has been used in the agricultural and industrial areas where severe droughts cause water shortage for drinking water and domestic water. The policy to promote the wastewater reuse has contributed to increase both the amount and the rate over the period of 2008-2018. The amount of treated wastewater is used in the order of the use in wastewater treatment plants, river maintenance water, industrial water, agricultural water and other water. The Korean government will establish a second national basic plan for water reuse in December 2020 to stimulate and expand water reuse. It will include plans, such as projects to supply treated wastewater to industrial complexes that require a large amount of water. Local governments also strive to expand water reuse. For example, Suwon City will build a wastewater reuse facility by 2025 to purify 325,000m3 of wastewater per day and supply industrial water to companies in Suwon and nearby. As more attention is paid to the increasing water pollution, some Korean companies have been using the zero liquid discharge (ZLD) treatment system for their own wastewater treatment. This method consumes a lot of energy and the production cost is high, but it doesn't discharge wastewater to the outside. Companies save 3040% of industrial water through the ZLD and wastewater reuse, such as Hyundai Motor Company which started the ZLD since 1996, SK Hynix, LG Chemical etc. Doosan Heavy Industries & Construction has developed its own ZLD technology since 2012 and has been applying it to some thermal power plants in Korea, such as Yeongheung Thermal Power Plant (1,250m3 per day). They will continue applying the technology to companies doing wastewater consignment treatment in the small and medium-sized industrial complexes. Surrounded by the sea on three sides, Korea has developed technologies to utilize seawater more effectively and has been building many seawater desalination facilities to secure alternative water resources from the sea. The Korean government has installed small scale seawater desalination facilities in the island areas where it

is difficult to build local and regional waterworks and have difficulty in getting water supply. About 70% of domestic seawater desalination facilities are located in island areas, which are mainly small-scale with a capacity of less than 1,000m3 per day. The installation will continue expanding in more islands to supply water. Seawater desalination seems the most realistic way to supply water in coastal regions and islands. K-water, as a public company for water, has been operating 36 facilities (2,390m3/day) in 8 local governments nationwide since 2004 and will continue the consigned operation. However, some problems need to be solved, such as high production cost, operational maintenance issues and facility aging caused by salinity in the island areas. Groundwater reservoirs prevent groundwater from flowing into the sea and raise the level of groundwater storage, as well as prevent seawater intrusion from the coast to land. They have no evaporation loss and have less risk of water contamination compared to regular reservoirs and do not have to submerge any area to create a reservoir. However, it is difficult to use large amounts of water at a time and the water temperature is low to use directly for irrigation. The developable amount of groundwater in Korea is 12.99 billion m3 per year, and the ratio of utilization to development capacity is 31.1% on average across the country. There are 6 groundwater reservoirs in Korea with a total capacity of about 150,000 m3 per day. Five groundwater reservoirs for agriculture were installed to solve the extreme drought problem in the 1980s as part of a national development plan for agricultural water. In 1998, Sokcho City installed a groundwater reservoir to supply water for domestic use that produces 80% of the total demand of the city.

United Arab Emirates: The UAE has limited natural water resources. It uses thermal desalination as the dominant technology to make seawater potable. Today, most of the country's potable water (42 per cent of the total water requirement) comes from some 70 major desalination plants, which account for around 14 percent of the world's total production of desalinated water. Due to lack of freshwater sources, it is important for the UAE to identify a sustainable desalination solution to meet long-term water needs. Connecting desalination technologies to renewable energy is one solution. The water consumed in the UAE is mainly desalinated, dependent on electricity in case of reverse osmosis, or a by-product of electricity generation through multiple-effect distillation (MED) and multiple-stage flash distillation (MSF). According to the State of Energy Report 2015, the demand for water grew largely at a rate of 35.8 percent from 2008 to 2012. The installed capacity for desalinated and groundwater reached 1,585 million imperial gallons per day, while water production was 393,878 million imperial gallons per year. Some of the desalination plants in the UAE include:

1)Shuweihat S2 power and water plant in Abu Dhabi: It has a production capacity of 1510 Megawatt (MW) of electricity and 100 Million Imperial Gallons (MIGD) of water per day

2)Jebel Ali power station in Dubai: It is the largest power and desalination plant in the UAE, with six gas turbines capable of producing 2060 MW and 140 MIGD of water.

3)F2 Plant in Fujairah: It is a greenfield power generation and seawater desalination plant with 2850 MW of power capacity and 230 MIGD of water.

The UAE has paid great attention to dams and rainwater harvesting projects. Dams contribute to protection from floods and flow risks and improve the quality and quantity of the water situation in the aquifer by increasing the feeding rates of groundwater.

Dams in the UAE include:

1)Wadi Al Beeh dam (Length: 575 metres, height: 18 metres)

The dam is located in the northern part of Ras Al Khaimah (RAK) in Al Beeh Wadi. It is constructed to feed the underground water. It supplies water to Al Burairat and Al Hamraniya in RAK.

2)Wadi Ghalfa dam (Length: 235 metres, height: 8 metres)

The dam is located in the Masfout region in Wadi Ghalfa, a middle agricultural region and is constructed to feed the underground water.

3)Wadi Wareaa dam (Length: 367 metres, height: 33 metres)

The dam is located in the eastern agricultural region of the UAE, Wadi Wareaa. It slopes from Masafi hill and pours into the Gulf of Oman. It is constructed to feed the groundwater and protect the area from floods. It feeds the areas of Al Badiya and Khor Fakkan.

4)Wadi Basira dam (Length: 885 metres, height: 8 metres)

The dam is located in the eastern agricultural region of the UAE, in Wadi Basira. It is constructed to feed the groundwater areas in Dibba and protect the area from floods.

5)Wadi Ham dam (Length: 2800 metres, height: 16 metres)

It is located in the eastern region of the UAE in Fujairah and is constructed to feed the underground water, protect the area from floods and enhance water quality. The dam feeds the local areas in Fujairah and Kalba.

6)Wadi Azan dam (Length: 110 metres, height: 10 metres)

It is considered as a small dam which impounds water and mitigates its speed. It is located in the northern agricultural region in Wadi Azan and constructed to feed the underground water. It feeds the Azan and Al Hamraniyah areas.

7)Wadi Al Ghail dam (Length: 26 metres, height: 4.5 metres)

It is located in the northern region of Wadi Al Ghail. It is constructed to supply irrigation water for Al Ghail area and feed the underground water.

The UAE saves no effort in expanding 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.

The Mohamed bin Zayed Water initiative aims to confront the urgent challenge of water scarcity around the world. It also aims to enhance awareness of the severity of the crisis of water scarcity and accelerate the pace of technological innovation to deal with the challenges it poses

Suqia - UAE Water Aid is a non-profit organisation established to support international efforts to provide potable clean water to people in need around the world and to contribute to finding permanent, sustainable and innovative solutions to water scarcity.

The UAE Water Aid Foundation also conducts studies and researches in coordination and partnership with educational, academic, and international organisations to support water production using solar power, and contributes to financing and supporting water-technology projects to combat drought.

The ‘Suqia’ campaign was launched to provide access to fresh drinking water for 5 million people around the world. The campaign, which was supervised by the UAE Red Crescent, received an overwhelming response and was a remarkable success. It surpassed its targets, collecting over AED180 million in 18 days, which is enough to provide water to over 7 million people around the world.

United Kingdom: International law on water quality is well-developed and governs freshwater resources (including rivers, lakes and transboundary groundwater acquifers), wetland conservation, marine conservation and marine pollution. Water policy is devolved and differs across the UK.

England:

'Clean water' is a key aim of the UK Government's 25-year environment strategy for England. Water is a 'priority area' under the Environment Act 2021 and the Secretary of State is due to set long-term targets of no less than 15 years for water standards. Water supply and sewerage is privatised in England with water companies responsible for water supply and sewerage services.

Draft river basin management plans have been produced under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. There are 10 river basin districts (RBDs) in England. The Environment Agency manages the seven RBDs wholly within England and jointly manages two of the three RBDs in Wales with Natural Resources Wales, and the Solway Tweed RBD jointly with the Scottish Environment Protection Agency. RBDs are sub-divided into management catchments, and further into operational catchments and water bodies. Information about each river basin includes maps, data on classifications, challenges, objectives, protected areas and programmes of measures.

A key mechanism for water management in England is the Catchment Based Approach (CaBA), introduced by Defra in 2013. These community-led partnerships have been established in each of the management catchments across England. Catchment partnerships are often lead by conservation organisations and are supported by a national network of Environment Agency catchment coordinators and an independent CaBA National Support Group.

Northern Ireland:

The Department of Infrastructure and Northern Ireland Water have introduced long-term plans relating to the water environment: Sustainable Water 2015-2040, Living with Water Programme (Water Resource Plan 2010-2035) and Northern Ireland Water's Strategy 2021-2046. The Department of Agriculture, Environment and Rural Affairs, with the Northern Ireland Environment Agency, have responsibility for water quality in Northern Ireland. Northern Ireland Water is a public body with responsibility for water supply and sewerage.

Scotland:

Scotland's water policy is found in Scotland's wider Environment Strategy to 2045. The River Basin Management Plan for Scotland 2021-2027 was published after consultation in 2021; that for the joint river basin district with England, Solway-Tweed, was updated in 2021. Water supply and sewerage services are provided by Scottish Water, a public sector body.

Wales:

A Water Strategy for Wales was published in 2015. River basin management plans to 2027 for Wales' three river basin districts detail the approach. River basin management planning operates under the Water Environment (Water Framework Directive) (England & Wales) Regulations 2017 and within Wales' wider legislative framework for water policy and for the environment under the Well-being of Future Generations Act 2015 and the Environment (Wales) Act 2016. NRW has undertaken an engagement process to identify 10 'opportunity catchments' in order to 'deliver sustainable management for both water and well-being outcomes.' Welsh Water is a not-for-profit company with responsibility for water supply and sewerage in Wales.

United States Of America: Water resources in the U.S. are dynamic and diverse but national water policy is fragmented and continually evolving. Numerous federal laws and agencies oversee various aspects of water policy, including both water supply and water quality. The federal government maintains and operates many water supply and storage systems for public and private use, particularly in the western states. The federal government has implemented a number of laws and programs aimed at improving water quality nationally, often in cooperation with states. States and local governments also maintain control over various aspects of water policy, particularly allocation of water rights. Increasingly, water resources are managed for a wide range of purposes, including municipal drinking water supplies, irrigation, recreation, and water quality. Water agencies have increased focus on managing water resources collaboratively in cross-agency efforts that include involvement from nongovernmental organizations and private citizens. River basins and watersheds provide useful biophysical units of action, but challenges arise in coordinating efforts across political boundaries. Population growth and increased water use create concerns about sustainability, particularly in groundwater systems. There is increased attention to water efficiency, especially at the state and local level. For water resources to be managed effectively in the future, agencies will need to work more closely together and incorporate adaptive management principles to meet dynamic and difficult challenges, including climate change. Ecological principles and ecosystem restoration are potential tools for providing sustainable supplies of water while

protecting ecosystem services, including flood control, water quality, and habitat. The evolution of water policy led to a diverse and fragmented agency structure at the federal level. Federal water policy is set through several important mechanisms, including Congress and federal agencies. A wide range of federal agencies play at least a minor role in managing or regulation water resources (more than 25 according to Allin, 2008), including the Department of Commerce and Department of Defense. Several agencies play a larger role in water policy, particularly those with a historical role in water management, such as USACE and Bureau of Reclamation. Congressional oversight and interest in water is similarly as varied. More than 40 Congressional committees and subcommittees deal with various aspects of water policy, resulting in fragmentation and overlap (Allin, 2008). The USACE still has influence on federal water policy, primarily through creating and managing water infrastructure projects. USACE is a large organisation, with over 37,000 civilian employees. The agency manages over 600 dams, 12,000 miles of navigable inland waterways, and over 300 million acre-feet of water storage capacity (USACE, 2013). While the era of massive construction projects (such as the Hoover Dam) is largely over, USACE still conducts a large number of building projects each year, particularly to manage existing water resource projects. USACE maintains the navigability of waterways, conducting maintenance projects such as dredging channel management, maintains flood control structures such as levees, and operates locks and dams on navigable waterways (Allin, 2008). The Corps is also a key player in power generation, managing roughly a quarter of the nation's hydroelectric capacity. In addition, the agency provides leadership and expertise to other federal agencies in construction projects and increasingly in environmental restoration. For example, USACE manages wetland restoration and mitigation projects on federal lands (USACE, 2013). The Bureau of Reclamation maintains a key role in managing water resources in the western U.S. Today the agency primarily maintains existing water infrastructure, primarily water supply and hydroelectric power projects. The agency maintains over 50 hydroelectric dams and is the largest wholesaler of water in the country (Bureau of Reclamation, 2013a). The impoundments and reservoirs managed by the agency provide considerable recreational benefits; a number of project sites are designated as National Recreation Areas managed by the National Park Service or U.S. Forest Service (Bureau of Reclamation, 2013b). As with the USACE, Bureau of Reclamation is increasingly focused on environmental restoration of project sites, though the agency is focused primarily on managing water and hydroelectric sources and providing irrigation water to customers in the western states (Gerlak, 2008). The U.S. Environmental Protection Agency (EPA) is the primary federal agency in charge of water quality, administering many of the regulations authorised by the CWA and Safe Drinking Water Act (SDWA) (see box "Major Water Laws"). The CWA is a far-reaching piece of legislation, imposing on states water quality

standards and a robust process of regulation and permitting. The EPA manages the federal side of these regulations, working with states to establish specific use categorizations for water bodies and operating the NPDES permitting system. States are required to establish technology standards and discharge limits for permitted entities to achieve broad federal water quality standards. If states fail to meet these requirements, EPA is authorised to take over for the state. In addition to regulating point source emitters (sources regulated under the NPDES permit system), EPA increasingly focuses on addressing nonpoint source pollution. Nonpoint sources (NPS) are not regulated under the CWA but are responsible for a large portion of the nation's water pollution (Brown and Froemke, 2012). EPA leads federal policy on NPS pollution by providing technical assistance and funding to states to implement programs aimed at reducing NPS pollution (Allin, 2008). The purpose of the CWA is specifically to restore all of the nation's waterways to fishable and swimmable. Passed in its current form in 1972, the CWA, along with the 1973 Endangered Species Act (ESA), did more to extend federal authority over water than any previous legislation (Benson, 2006). By tasking the federal government to "restore and maintain the chemical, physical, and biological integrity of the nation's waters" (CWA, s. 101, in Allin, 2008), the CWA provided a legal basis for the federal government to regulate and control both water quality and water supply, an area that was previously the purview of the states. The ESA is administered by the U.S. Fish and Wildlife Service and places limits on federal, state, and private actions that threaten endangered species. This includes projects or actions in regards to water that would damage endangered fish or wildlife habitat. Along with the CWA, this law extends federal authority over water to include environmental quality, through regulation of both water quality and structural habitat (Allin, 2008). Through these two laws, the ability of the federal government to restrict state, local, or private development of water bodies is quite strong (Allin, 2008; Benson 2006).

b. ORGANISATIONS:

Earth Liberation Front(ELF)

The Earth Liberation Front (ELF) and its sister organisation the Animal Liberation Front (ALF) are believed responsible for some 600 criminal acts between 1996 and 2002 and some $43 million in damages. Committed to direct action and revolutionary violence, ELF relies on a leaderless resistance model of operations. They have no discernible organisational structure and rely on members who understand the organisation's goals and orientation to take action on their own initiative, making identification and prosecution of perpetrators

very difficult. ELF favours rollback of industrial civilization to preserve the environment. ELF is media savvy and unlike Islamist terrorists, generally "want a lot of people watching, not a lot of people dead." Their tactics emphasise attacks on property not people and include arson, sabotage, and vandalism designed to cause significant economic damage. Targets have included research laboratories, multinational corporations, and the logging industry. ELF poses an immediate and direct threat to research facilities and labs involved in or seen as involved in research on genetically modified organisms, but could easily shift to nuclear industry targets.

Regarding water, ELF has previous actions as listed:

1. March 14, 1997, near Eugene, Oregon: Tree spiking at Robinson-Scott timber harvest site in the McKenzie River watershed, Willamette National Forest . Joint ALF / ELF claim.

2. January 23, 2000, Bloomington, Indiana: Arson destroys a partially built luxury home. Investigators found a message spray-painted in black on a sign near the house: "No Sprawl ELF." The ELF later issues a communiqué saying it torched the home because it was in the Lake Monroe Watershed, which provides drinking water to the city of Bloomington. Damages: $200,000.

3. September 22, 2003, Martiny, Michigan: The ELF claims responsibility for planting plastic bottles containing flammable liquid at an Ice Mountain Spring Water Company (a subsidiary of Nestle) pumping station. The devices are apparently intended to start a fire at the premises but are discovered by maintenance workers before they are set ablaze. In a written statement, the ELF stated:

We will no longer stand idly be while corporations profit at the expense of all others. To this end, we have taken action against one of the pumping stations that Perrier uses to steal water… Clean water is one of the most fundamental necessities and no one can be allowed to privatise it, commodify it, and try and sell it back to us.

Two months later a judge orders the company to halt pumping water from the wells. Nestle had been removing 200 gallons of water from the ground per minute and was lowering the water table.

The actions specified are not the only actions that ELF had taken. ELF has 81 confirmed acts of arson between 1997 and 2009.

Global Water Partnership:

The Global Water Partnership is an intergovernmental organisation comprised of 13 Regional Water Partnerships (RWPs) and 86 Country Water Partnerships

(CWPs), with the mission to advance governance and management of water resources for sustainable and equitable development. GWP is a global network including over 3000 partners ranging from government institutions (national, regional and local), intergovernmental organisations, international and national non-governmental organisations, academic and research institutions, companies, and service providers in the public sector. Together with the partners, GWP helps countries to connect water resources planning and operations at different scales, transboundary, regional, basin, national, and local, so that actions are coherent and sustainable.

Programmes that are included under the WACDEP umbrella:

1. The WACDEP in Africa with focus on putting in place investments for water security and climate resilience, jointly implemented with the AU and African Ministers Council on Water (AMCOW),

2. The Regional WACDEPs in Asia, Latin America, the Caribbean, and Europe, which are modelled on the WACDEP in Africa but developed with regional context and ownership;

3. The Associated Programme on Flood Management (APFM), a joint initiative of the World Meteorological Organization (WMO) and GWP promoting the concept of Integrated Flood Management (IFM). The WMO-GWP Integrated Drought Management Programme (IDMP) focusing on promoting better scientific understanding and inputs for drought management for enhancing drought resilience,

4. The Deltas Climate Resilience Programmes for enhancing climate resilience of delta regions. Enabling Delta Life" is a joint project with the Delta Alliance, supported by the Netherlands Ministry of Development Cooperation

By supporting activities for improved management of water resources, for example, through drought and flood management, the WACDEP contributes to enhanced resilience to climate change, aligning actions to support the implementation of the Paris.

World Water Council(Conseil Mondial de l'Eau):

The World Water Council is an international non-governmental organization with a total of 379 members from 50 different countries. Established in 1996 with the aim of developing awareness of fair water use in the world, the World Water Council, including taking the most effective decisions at all levels, makes political commitments when necessary to ensure the global sustainability of critical life resources for the protection, development, planning, and water level use management.

The World Water Council conducts its important activities in the field of water through the 36-member Board of Governors, which is the executive body and elected every 3 years. The Board of Governors (Executive Board) consists of a chairman, a vice president, 4 office members, 30 board members (a chairman and 35 members), 1 permanent observer, and 3 forum observers. The Council is chaired by Loïc Fauchon from France.

The Council carries out various activities in order to underline the importance of water in the world agenda, to support the studies of the solution of water problems in the world, to draw the attention of the public by making suggestions that shall be exact solutions and to make political decisions on these issues. One of the most important of these activities is the World Water Forum, which is held every three years together with the Ministerial Conference and water exhibition. The forum and the exhibition, which serve to share the knowledge and experiences of the countries, are held in a different country each semester. The four main purposes are:

1. To increase the importance of water on the political agenda
2. Formulating concrete proposals and bringing their importance to the attention of the world public
3. Creating political commitments
4. To ensure the efficient use of water resources

At the Forum, in which academicians, scientists, representatives of international organisations, and non-governmental organisations participate, discussions on current water issues and important results are obtained for water problems. Throughout the forum, the innovations of the private sector companies in the field of science and techniques related to water are introduced in the exhibition.

International Water Association(IWA):

The International Water Association (IWA) is a global network of water professionals spanning the continuum between research and practice and covering all facets of the water cycle. IWA members represent the leading edge in their fields of expertise and work together to build new frontiers in global water management through interdisciplinary exchange and collaboration. The Headquarters and Publishing dept. is in London, UK whilst the global operations are in The Hague, Netherlands. There is also a regional office in Singapore that services the IWA membership and coordinates the IWA activities and programs within the East-Asia and Pacific Region. The organization has no registered commitments.

The Sendai Framework Voluntary Commitments (SFVC) online platform allows stakeholders to inform the public about their work on DRR. The SFVC

online platform is a useful tool to know who is doing what and where for the implementation of the Sendai Framework, which could foster potential collaboration among stakeholders. All stakeholders such as; the private sector, civil society organizations, academia, media, local governments, etc. working on DRR can submit their commitments and report on their progress and deliverables.

5. Past resolutions and solutions

a. UN General Assembly Resolution 64/292 (2010)

The United Nations General Assembly has declared a resolution calling upon the member states and international organizations to provide financial resources, capacity building, and technology exchange and transfer to help countries, especially developing ones; in order to provide safe, clean, accessible, and affordable drinking water and sanitation for all.

b. Sustainable Development Goals (SDGs) - Goal 6 (2010)

Goal 6 is a part of the UN 2030 Agenda for Sustainable Development and aims to ensure the availability and sustainable management of water and sanitation for all by 2030. It also includes the targets to achieve universal and equitable access to safe and affordable drinking water, improve water quality, implement integrated water resource management, and protect and restore water-related ecosystems.

c. World Water Forum

World Water Forum is held every three years, in order to bring together the stakeholders from various business sectors and develop solutions to global water challenges. It also promotes the collaboration and exchange of consensus, technologies, and practices to address water issues.

6. Questions to be Considered

- How can access to clean water be expanded worldwide?
- How can international cooperation be provided regarding the question of access to clean water?
- How can highly highly-developed countries be involved in the international question of the inaccessibility of clean waters?
- What is the role of domestic and international Non-Governmental Organisations (NGOs) in the concern of inaccessibility to clean waters?
- How can the cooperation between the governments and the NGOs be improved?
- What lessons can be taken from the past water clean water crises worldwide?

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