2017 – 2018
Model Arab League

BACKGROUND GUIDE
Council of Environmental Affairs Ministers

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Original draft by Katarina Boehm, Chair of the Council of Arab Environmental Affairs Ministers at the 2018 National University Model Arab League, with contributions from the dedicated staff and volunteers at the National Council on U.S.-Arab Relations.

Honorable Delegates,

It is my great pleasure to welcome you to the 2017-2018 Model Arab League season! My name is Katarina Boehm, and I will be the Chairperson for the Council of Arab Environmental Affairs Ministers at both the National University Model Arab League and the Northeast Regional Model Arab League. I am a senior at Northeastern University, double majoring in Environmental Science and Political Science. This will be my fourth year participating in Model Arab League simulations, and I am ecstatic to serve as Chair for one of my favorite committees. The Council of Arab Environmental Affairs Ministers gives delegates the unique and important opportunity to combine their diplomatic skills with scientific acumen, and the results can be spectacular! I hope you all gain as much from this program as I have over the last several years - I have connected with friends and mentors, discovered lasting passions, grown in confidence, and been given fulfilling professional opportunities as a result of my earnest and dedicated participation in Model Arab League. I encourage you all to give your best self to this program so that you may receive its gifts back in spades.

While the most thrilling part of the Model Arab League experience may be the conference, the work prior to your arrival is extremely important. The best way to be successful is by building a foundation of knowledge on which you - the delegate - can stand. Truly learning your country's policy is invaluable. This guide will help you begin to build your foundation, but further research is necessary! Explore news articles, speeches, government websites, intergovernmental organizations, and scholarly publications on your topic and your country. Doing so will set you up to be knowledgeable, accurate, and successful during the conference. While the topics covered at Model Arab League conferences are contemporary and deeply important to many of us, participants are expected to represent the views of the country they have been assigned, and to exclude their personal opinions from their representation.

At conference, diplomacy and respect are key. Expect debate to get intense at points, but remember that above all, this is an opportunity for everyone in the room to learn something new and expand their horizons. I encourage you all to be more than respectful - be kind.

I look forward to meeting many of you at Nationals and the Northeast Regional, and wish all of you luck during the 2017-2018 season! I hope you have as enjoyable and transformative an experience as I have.

Best,
Katarina

Topic 1: Exploring individual and pan-Arab paths to meet climate goals set out by member states in the 2015 Paris Agreement.

I. Introduction

A. General Background

The Paris Agreement on Climate Change, adopted in December 2015, is an agreement of the Parties of the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC entered into force in 1994, and is one of three climate-focused conventions created at the Rio Earth Summit in 1992.[1] The states that signed on to this Convention are known as "Parties" to the Convention, as states that agree to uphold it and its tenets. The UNFCCC is important because it officially recognized climate change as an issue, set lofty but achievable goals, and placed accountability measures on Parties.[2]

The Paris Agreement, otherwise known as the Paris Climate Accords, or the COP21 Agreement, is a document created by the Parties of UNFCCC at the 21st Conference of Parties (COP21), held in Paris in 2015. For reference, COP22 was held in Marrakech in 2016, and COP23 will be held in Bonn in November 2017. COP22 served not only as the Conference of Parties to the UNFCCC, but also as the first meeting of the Parties to the Paris Agreement (CMA 1) and the twelfth meeting of the Parties to the Kyoto Protocol (CMP 12). It was during this meeting in 2016 that the Paris Agreement officially entered into force, one month after the ratification threshold was met.[3]

The Paris Agreement has multiple prongs set to lessen the impact of climate change, but the key element is ensuring that global temperatures don't rise more than two degrees Celsius above the current global temperature. The Paris Agreement calls upon Parties to devise plans to achieve this goal - and ideally, to limit the rise to one and a half degrees Celsius. Parties are required to create and submit nation-specific goals and strategies that outline their commitment to reducing their contribution to global average temperature rise. These documents are called nationally determined contributions (NDCs) and they represent the mitigative and reconciliatory actions a state intends to undertake. NDCs include information such as emissions reduction goals and strategies, sustainable building goals, and environmental restoration plans.[4] These NDCs will be vital to discussion on this topic, which charges the Council of Arab Environmental Affairs Ministers with the exploration of both nation-specific and League-wide measures to meeting the

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[1] "Introduction to the Convention." United Nations Framework Convention on Climate Change. *UNFCCC*. N.p., 16 Aug. 2016. <link>
[2] Ibid.
[3] "FAQs ABout How the Paris Agreement Enters Into Force." World Reources Institute (WRI). *World Resources Institute.* N.d. <link>
[4] "NDC Registry (Interim)." UNFCC. *UNFCC.* N.d. <link>

goals set out in states' NDCs, and ultimately, to assist in a worldwide effort to limit average temperature rise.

B. History in the Arab World

Almost two hundred states signed the Paris Agreement at COP21 in 2015 - including all members of the Arab League except Syria, who was not expected to sign the Agreement given the ongoing civil war. Of the twenty-two members of the League, fourteen have signed and ratified the Agreement, contributing to its entry into force. These fourteen states are Algeria, Bahrain, Comoros, Djibouti, Egypt, Jordan, Mauritania, Morocco, Palestine, Qatar, Saudi Arabia, Somalia, Tunisia, and the UAE.[5] All of these states (excluding Palestine) have also submitted and made publically available their NDCs. The remaining members of the League have not ratified the Agreement, nor have they submitted NDCs.[6]

In context, the Paris Agreement is a milestone in a decades-long discussion on slowing and eliminating the threats of climate change. The Middle East and North Africa (MENA) region is one of the most vulnerable to climate change, as one of the driest and most water-scarce geographic regions on Earth. Additionally, large swathes of its population and economic activity lie within flood zones, in urban coastal areas and along waterways, and these populations also depend upon climate-sensitive agriculture. When viewed through this lens, MENA states should be very concerned about climate change - and many have already taken steps to combat it. Still, it remains important to recognize that these factors have been the reality in this region for millennia, and societies have developed technological, cultural, and institutional mechanisms to deal with extreme heat, water scarcity, and limited arability.[7]

On an intergovernmental basis, MENA states have been important members of climate discussion since the inception of the three Rio Conventions (of which UNFCCC is one). They have been Parties to climate-focused legislation, including the Kyoto Protocol, and more topically-specific documents, such as the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES).[8] The League of Arab States, in addition to having a ministerial-level council on the environment, has worked as a League with other international organizations, such as the UNEP, to establish joint initiatives and cooperative programs.[9]

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[5] "Paris Agreement Ratification Tracker." Climate Analytics. *Climate Analytics.* 4 August 2017. <link>.
[6] "NDC Registry (Interim)." UNFCC. *UNFCC.* N.d. <link>.
[7] "Adaptation to Climate Change in the Middle East and North Africa Region." The World Bank. *World Bank Group.* 2015. <link>.
[8] "What is CITES?" The Convention on International Trade in Endangered Species of Wild Flora and Fauna. *CITES Secretariat.* N.d. <link>.
[9] "UNEP signs Landmark Agreement with League of Arab States to Strengthen Partnership on Environment and Sustainable Development." UNEP Newscentre. *UN Environment.* 10 November 2014. <link>.

On an individual level, states implement national environmental policy. Each state has its own agency or agencies responsible for environmental concerns, including agriculture, fishing, water resources, and emissions and climate change. There have been some shining examples of environmentally-conscious policy, including Morocco's large-scale solar project, the Noor solar power complex, or the Emirati "Estidama" green building code and achievement system, which aims to encourage and require buildings in Abu Dhabi to meet certain sustainability goals.[1011] Even Saudi Arabia, which produces the second largest amount of oil per day (following Russia),[12] has its eye on emissions and climate change - in their NDC, Saudi Arabia describes its plans to diversify its economy with a wide variety of renewable energies, and to create the "world's largest carbon capture and use plant."[13]

C. Finding a Solution to the Problem: Past, Present, and Future

Considering the MENA region's acknowledgement of climate change as an issue, and the very real threats many MENA states are facing, what can the League create, construct, or provide for in order to help states meet these needs, both as established by the Paris Agreement's goal of a less than two degree global average temperature increase, and by individual states' NDCs?

In reaching individual and specific environmental policy goals, some states may seek assistance in regards to funding, research, tools and technology, and/or personnel. Beyond the resource gap states may face, the Council should consider how it can encourage and ensure that Arab states are doing their part to mitigate average global temperature rise. The Council might consider League-wide standards or programs that limit carbon and other greenhouse gas (GHG) emissions, encourage renewable energy usage, support reforestation, promote sustainable water use in agriculture, etc.

Members of the Council should consider whether an intergovernmental framework would be helpful in this situation, and if so, what shape it would take. Members should recall that while not all states have crafted NDCs, twenty-one of the twenty-two members of the League signed on to the Agreement, thereby agreeing to strive towards the "two degrees" goal. How can the League assist all members with this goal - on an individual and pan-Arab basis?

Members of the Council should also consider moves made by other intergovernmental organizations to assist states with achieving and upholding the Paris Agreement targets. For

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[10] "Vast Moroccan Solar Plant is a Hard ACt for African to Follow." Fortune. *Time Inc.* 5 November 2016. <link>.
[11] "Estidama Pearl Building Rating System in Abu Dhabi." Green Emirates. *Green Emirates Consulting.* 2017. <link>.
[12] Carpenter, Claudia. "Russia Overtakes Saudi Arabia as World's Top Crude. <link>.
[13] "The Intended Nationally Determined Contribution of the Kingdom of Saudi Arabia under the UNFCCC." The Kingdom of Saudi Arabia. November 2015. <link>.

example, in early 2017, the European Union voted to make the stipulations of the Paris Agreement legally binding, and also created a mechanism for financial assistance for member states' projects and efforts to achieve emissions reduction targets.[14]

II. Questions to Consider in Your Research

- Why does my state have a vested interest in climate change?
- How have my state's economic, societal, and institutional circumstances shaped its environmental policy?
- What type of assistance does my state need in order to accomplish its climate change goals? What kind of assistance can my state offer?
- If my state has not yet signed or ratified the Paris Agreement, why? What reservations does my state have with the Agreement?
- How does my state view multilateral environmental policy? Does my state have a history with multilateral agreements concerning energy sharing or transportation, water use, etc.?

III. Questions a Resolution Might Answer

- In what ways does the Paris Agreement provide for the goals it lays out? In what ways does it fail to provide for those goals, and how can the League fill those gaps?
- How can League members enhance or augment existing systems to fulfill the needs of the Paris Agreement and states' NDCs?
- How can the League implement multi-state climate policy interventions? Are enforcement measures appropriate?
- Which specific domestic practices and policies are applicable League-wide?
- Does the League need to incentivize climate change policy?

IV. Additional Resources

- Climate Change and Adaptation in the Middle East and North Africa
  This working paper from the Dubai Initiative offers a thorough view of climate change vulnerabilities in the MENA region, and introduces mitigation and adaptation as policy steps for MENA states. The report ends with policy suggestions on specific challenges, including agriculture and energy security.

- Options for Climate Change Policy in MENA Countries after Paris
  This article, coined as a "Policy Perspective," discusses the implications of the Paris Agreement and states' NDCs. The paper suggests that most of the emissions avoidance and mitigation strategies available to MENA states are through energy diversification, energy efficiency, and other market-based strategies.

[14] "The European Union Just Voted To Make The Paris Agreement Legally Binding." IFLScience! *IFLScience.* 2017. <link>.

- Climate change impacts in the MENA region and their implications for vulnerable population groups
  This article discusses the impacts of climate change on industries that particularly affect rural populations, such as agriculture. The article describes a cycle of loss of livelihood and increased demand for food supplies, and suggests adaptive measures to "absorb any kind of shock" from climatic detriment on key infrastructures and systems.

- MENA Regional Meeting of CVF Hosted by Lebanon in Geneva
  This press release from a meeting of the Climate Vulnerable Forum discusses fourteen recommendations aimed at improving a regional response to climate change, including disaster risk assessment, climate finance, and technological knowledge transfer. Though not all members of the League attended this meeting, all attendees were members of the League.

Topic 2: Designing a framework to protect, preserve, and rehabilitate natural environments of historical, biological, or cultural importance, with consideration for the social benefits and economic potential of doing so.

I. Introduction

A. General Background

Natural resources and the landscapes that contain them have always been an important factor in the development of society and culture. However, the utilization of the natural environment is not the only reason for its importance. Natural environments are often of great historical and cultural importance to people, and are always intrinsically important to supporting non-human life and biodiversity. Breaking down these concepts further will help illuminate the importance of protecting, preserving, and rehabilitating natural environments.

The historical and cultural importance of the environment can seem subjective, but often comes down to the importance of heritage and a population's or state's drive to keep the history of their people alive. Because of early society's dependence on the local environment, certain plants or animals, or other natural features such as rivers, mountains, or forests, are of great importance in the history of a civilization. Protecting and preserving these environments, including their wildlife and landforms, ensures that the descendants of these early peoples are able to tell the story of their past, and to engage visitors, young people, and researchers.

The biological importance of natural environments is based on the principle of biodiversity. Biodiversity can be defined simply as "the variety of life."[15] More specifically, it refers to both genetic diversity and ecological diversity, meaning that there is both a wide gene pool for species, and that a variety of species inhabit and interact with and within an environment. [16] Genetic diversity helps prevent diseases and leads to greater evolutionary potential. Ecological diversity is important for the sustainment of a diverse and adaptable diet, human ability to discover and develop medicine, and the stability of the environment. Additionally, biodiversity ensures that needs of the environment, of which humans are a part, are being met. Wildlife is able to naturally clean water, absorb toxins, and regulate oxygen and carbon dioxide - all necessary services provided for by a biodiverse ecosystem.[17]

Understanding the historical, cultural, and biological importance of the natural environment, the international community has taken a multitude of steps to protect and preserve the environment. The most obvious example of this is through UNESCO, the UN Educational, Scientific, and

[15] "What is Biodiversity?" National Wildlife Federation. *National Wildlife Federation.* 2017. <link>.
[16] Ibid.
[17] Ibid.

Cultural Organization. One of UNESCO's signature projects is the World Heritage List, which identifies important sites (natural or built) with significant historical, cultural, or biological importance. While the majority of the sites in the List were selected for their importance to human history, several sites are of "natural" or "mixed" importance, meaning that they are important both culturally and environmentally. Natural sites are often areas of bountiful wildlife or vital ecosystem services. There are sites throughout the League of environmental importance, from Mauritania's Banc d'Arguin National Park to Yemen's Socotra Archipelago. Even some of the cultural sites, such as Bahrain's "Pearling" site, focus on the natural environment's role in economic and cultural matters.[18]

UNESCO and other international conservation organizations, such as the International Union for the Conservation of Nature and the World Wildlife Fund, are working to preserve natural environments for the future use and appreciation of mankind. However, due to the sheer size of the projects they undertake and the unintended consequences of denoting something as a "heritage site," UNESCO and other organizations are not always able to meet the need of all states involved.[19]

B. History in the Arab World

In the Arab world, there are several reasons to protect and rehabilitate the natural environment. There are historical and cultural reasons, similar to UNESCO's "heritage" claims; there are health-related reasons, in terms of both pollution reduction and the benefits of direct exposure to the natural world; and there are economic benefits, especially in terms of agricultural and marine productivity.

Within each member state, policies have been put in place to protect and rehabilitate natural environments, both terrestrial and marine. Some states, such as Morocco, have focused on reversing detrimental processes linked with climate change such as deforestation and desertification.[20] Other states, including Oman, have emphasized the creation of national parks or protected areas, where limited resource use is allowed and the environment is intentionally preserved.[21] This topic asks members of the Council to consider a framework that could do both of these things, and more, on a League-wide level.

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[18] "World Heritage List." United Nations Educational, Scientific, and Cultural Organization World Heritage Centre. *UN World Heritage Centre.* 2017. <link>.
[19] Erlanger, Steven. "What Does UNESCO Recognition Mean, Exactly?" New York Times. *The New York Times Company.* 6 January 2012. <link>.
[20] "Morocco sets off on a 10-year plan to hold back the desert." euronews. *euronews.* 24 August 2015. <link>.
[21] "National Park to come up at Al Saleel Wildlife Reserve." Times of Oman. *Muscat Media Group.* 29 June 2014. <link>.

The economic and social benefits of protecting, preserving, and rehabilitating the environment are particularly important in the MENA region. The economic benefit is intrinsic - protecting the environment reduces future costs, preserving it offers a unique opportunity for environmentally-based industry, such as eco-tourism and agriculture, and the rehabilitation of the environment slows the detriments of climate change and human development, including the climate-induced issues such as desertification, which reduces available arable land, and human-impacted processes, such as saltwater intrusion, which devastatingly decreases both crop yields and available fresh water.

As stated, each individual state currently has its own environmental protection, preservation, and rehabilitation plans in place. The next step is determining how the League can interweave those plans and beneficially assist in their enforcement.

C. Finding a Solution to the Problem: Past, Present, and Future

Given the patchwork of policies across League members, this Council should consider ways in which environmental protection, preservation, and rehabilitation can be established, guided, and provided for through the intergovernmental mechanism provided by the League.

The Council should consider how UNESCO and other intergovernmental organizations have both succeeded and failed at similar aims of environmental protection. In a critique of UNESCO's World Heritage Program, author Keough posits that the "program may have created a culture of economic and political quagmires rather than cooperation and preservation."[22] Members of the League should consider Keough's claim, and explore ways in which the model of UNESCO's program has not succeeded, in order to create a more useful, targeted preservation and rehabilitation program.

Further, the Council should contemplate what shape this "framework" should take. While an additional council may seem simple and palatable, members should consider whether an additional committee will actually achieve of the aims of the topic. They might also explore on-the-ground programs that interact with both the government and the populations of member states, and the necessity of funding. The Council must also decide how natural environments, or pieces thereof, are chosen to be part of the framework, or the criteria they should possess. Is it important that the environments are remote, or should they be close to population centers? Should the framework focus on areas of great economic importance, or concentrate instead on societal-cultural implications - or should it do both?

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[22] Keough, Elizabeth Betsy. "Heritage in Peril: A Critique of UNESCO's World Heritage Program." *Washington University Global Studies Law Review.* 10:3 (2011). <link>.

Finally, Council members should closely study the history of environmental protection and rehabilitation in their own states, in order to suggest tangible best practices, as well as understand the needs and desires of their governments. This topic requires both depth and breadth of environmental understanding, specifically as it relates to the importance of protection and rehabilitation.

II. Questions to Consider in Your Research

- What specific programs and policies has my state enacted to protect, preserve, and rehabilitate the natural environment? Why has my state chosen these specific actions?
- What natural environments within my state are of great historical, cultural, and biological importance?
- What political and economic barriers exist within my state that might inhibit environmental protection, and specifically, this type of work on an intergovernmental basis? What can the League do or provide to my state in order to overcome these barriers?
- How have related intergovernmental efforts, such as UNESCO's World heritage Program, positively and negatively affected my state, its economy, and its culture?

III. Questions a Resolution Might Answer

- In what ways have previous intergovernmental environmental protections projects succeeded? In what ways have they failed to achieve their goals? In what ways would a League-wide framework improve the current state of environmental protection, preservation, and rehabilitation within member states?
- How does a League-wide effort increase the economic and social benefits of environmental protection? Does specific focus need to be applied to these benefits within a proposed framework?
- How can the League keep members accountable on this topic? What appropriate repercussions and incentives exist, and are they necessary?

IV. Additional Resources

- UNESCO World Heritage List
  UNESCO has listed over 1000 culturally- and naturally-important sites across the globe. They are listed here by country and by site type, with justification, photos, and descriptions of sites.

- Heritage in Peril: A Critique of UNESCO's World Heritage Program
  This article describes the potential negative impacts UNESCO's World Heritage program has had on the sites it has deemed worth protecting, including complications from increased tourism and political maneuvering.

- Biodiversity in arid regions: values and perceptions
  This article offers a strong argument for the positive implications of biodiversity in arid regions (where biodiversity is often seen as an impossible feature). The paper offers historical examples of arid region societies avoiding diminishing biodiversity, and discusses the economic issues related to biodiversity and development.

- Roles of Socio-Economic Incentive towards Sustainable Environmental Conservation of Kondoa Rehabilitated Rural Area, Dodoma, Tanzania
  Although this case study focuses on a state outside of the League, it does a great job supporting the economic, societal, and cultural implications of environmental conservation. While mainly researched through statistical methods, this paper offers five recommendations to policy makers and related experts on how to incentivize effective conservation measures.

Topic 3: Evaluating and mitigating the negative environmental impacts of water-related infrastructure and resource use, e.g., the construction of dams and canals or the overuse of aquifers, as well as the desalination industry.

I. Introduction

A. General Background

There are a number of factors threatening water security and supply in the MENA region. Some of these are intuitive: climate change impacts the supply of water through precipitation and evaporation variation, territorial conflict impacts the security of a state's water supply, and water-reliant economic sectors such agriculture – which uses up to 85% of the region's water as an industry – reduce potable water while adding to wastewater production and the pollution of water bodies.[23] Other factors are less obvious, but that does not make them any less threatening. In the MENA region, collecting, producing, purifying, distributing, and using water can all negatively impact the environment and the availability of clean water.[2425] This topic asks the Council to consider the negative environmental impacts of water infrastructure and use, and of the desalination industry. While every infrastructure project will have independent environmental impacts, there are often impacts typical of a specific type of infrastructure.

Dams, canals, wells, and irrigation systems all pose threats to the natural environment. Dams, built to control the flow of river water and create reservoirs, are most often used to create a potable water supply or hydropower. Though they generally serve this purpose if built correctly and maintained, their presence can disrupt fish migration and sediment flow. Though seemingly innocuous, sediment blockage can cause massive detriment downstream. Life along the river relies on the distribution and replenishment of river sediment, which contains nutrients vital to both aquatic species and the riparian (streamside) environments. When rivers experience a sediment blockage upstream, they erode their river beds in order to compensate. A deeper river leads to a lowered water table, which limits plant growth and human access to groundwater.[26] Canals can lead to the leakage of saltwater into groundwater reservoirs, can disrupt water quality and aquatic life, and introduce harmful invasive species to new ecosystems.[27] Wells have the obvious but adverse impact of lowering the water table, as well as the habitat loss involved with their construction.[28] Irrigation and distribution systems may also negatively impact the water

[23] "Water Sector Brief." World Bank. *World Bank Group.* September 2010. <link>.
[24] Ibid.
[25] Siddiqi, Afreen and Laura Diaz Anadon. "The water–energy nexus in Middle East and North Africa." *Energy Policy.* 39 (2011). <link>.
[26] "Environmental Impacts of Dams." International Rivers. *International Rivers.* N.d. <link>.
[27] "Environmental Impacts of Canals." *WIll the Dead Sea Rise Again?* N.d <link>.
[28] "Groundwater flow and effects of pumping." USGS. *US Department of the Interior.* 2 December 2016.<link>.

table, and the quantity of water flowing downstream (if the system is diverted from a river). The construction of systems also leads to habitat loss and reduced biodiversity, and may induce saltwater intrusion.[29]

Additionally, the overuse of water resources, most notably of aquifers, has rippling impacts on the surrounding environment. When water is pumped from a groundwater system, the water table lowers, which diverts groundwater from nearby water systems and reduces available water. Over time, groundwater systems recharge naturally; that is, precipitation and infiltration of water "refill" the aquifer. However, when water is pumped at a rate exceeding the natural recharge rate, the water table – and aquifer – will continue to lower and deplete at an unsustainable rate. This can reduce plant and animal populations, decrease biodiversity, intensify drought, lead to increased saltwater intrusion and other pollution - the list continues. Sustainable water use is a top priority for many MENA states due to the threats of overuse.[30]

Finally, the desalination industry presents multiple challenges, from heavy energy use to the discharge of polluted brine. Desalination is the process of converting saltwater to "fresh" water suitable for drinking, and necessary as it may be for some states, requires massive amounts of energy.[31] This high need for energy brings into question what fuel sources are being used (or how the needed electricity is produced), and this opens up the concern of environmental degradation due to fuel and energy production and use.[32] In terms of immediate environmental damage, the intake process of desalination operations can result in decreased biodiversity (as intake pipes suck up not only water, but millions of plankton and other miniscule organisms and nutrients that constitute the base layer of marine food chains), and the disposal of waste product, which contains not only salt, but chemical byproducts, and can "wreak havoc" on marine ecosystems if it is dumped irresponsibly.[33]

This overview of the negative impacts of water-related infrastructure, water use, and desalination is by no means exhaustive, nor does it satisfy the amount of research necessary to truly understand the topic before the Council. Acknowledging the threat is step one, but mitigation requires a deeper understanding of each negative impact, and so all members of the Council are encouraged to conduct further research on these topics and the possible mitigative measures.

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[29] "Major impacts of irrigation and drainage projects." Environmental Assessment of Irrigation and Drainage Projects. *FAO, Natural Resources Management and Environment Department.* N.d <link>.
[30] "Groundwater flow and effects of pumping." USGS. *US Department of the Interior.* 2 December 2016.<link>.
[31] Siddiqi, Afreen and Laura Diaz Anadon. "The water–energy nexus in Middle East and North Africa." *Energy Policy.* 39 (2011). <link>.
[32] Ibid.
[33] "The Impacts of Relying on Desalination for Water." Scientific American. *Nature America, Inc.* N.d. <link>.

B. History in the Arab World

The MENA region is the most water-stressed region in in the world. As a geographic region, it is home to seven percent of the world's population, but only 1.5% of the world's renewable freshwater supply.[34] This scarcity will only worsen as climate change continues to decrease local precipitation and increase average temperature - considering such scarcity, it is imperative for the region that states consider ways to lessen their contribution to climate change, the overuse of water supplies, and detrimental effects of water infrastructure, many of which are intrinsically tied to water availability and the climate.

Water infrastructure is both necessary and unavoidable. Every member of the League has infrastructure built to produce and distribute water, and the Council should consider specific histories and cases of detriment caused by infrastructure when considering this topic, while building off of the "typical" or possible implications described previously. Case studies can tell of environmental impacts specific to the region.

Take, for example, the River Nile. There are two large dams on the Nile - The Aswan High Dam on the border between Egypt and Sudan, and the Grand Ethiopian Renaissance Dam (GERD) in Ethiopia near the border with Sudan, which is under construction and scheduled for completion in October 2017. The Aswan High Dam has created Lake Nasser, a reservoir which provides water - largely for irrigation - to both Sudan and Egypt, helps control flooding, and generates hydropower. These positives unfortunately come with negative environmental impacts as well. The "flood control" refers to annual flooding that occurred along the floodplains of the river, which deposited new, fertile sediment along the banks, increasing nutrients for crop production. This sediment distribution no longer occurs, which has had negative implications for crop growth. The dam has also contributed to soil salinity closer to the delta.[35]

Keeping in mind that the River Nile flows south to north (towards the Mediterranean), a dam *upstream* in Ethiopia will impact the local environment as well as the downstream environment. GERD is being constructed along the Blue Nile, a tributary of the River Nile that runs through Ethiopia. It is the subject of considerable political tension, with Egypt and Sudan strongly opposed to the project, and Ethiopia continuing forward, unmoved. Once constructed, GERD will be the largest hydroelectric dam in Africa - its hydropower output will actually exceed the power need in Ethiopia, resulting in excess power that can be sold internationally.[36] GERD has

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[34] Joffe, George. "The Impending Water Crisis in the MENA Region." *The International Spectator.* 51:3 (2016). <link>.

[35] Lombardo, Crystal. "Aswan Dam Environmental Impact." Vision Launch.*Vision Launch Development Group.* 3 November 2016. <link>.

[36] Conniff, Richard. "The Vanishing Nile: A Great River Faces a Multitude of Threats." *Yale Environment 360. Yale School of Forestry and Environmental Studies.* 6 April 2017. <link>.

the potential to heavily reduce downstream flow, decrease ecosystem viability in the delta, accelerate salt accumulation in the surrounding arable soil, and exacerbate drought periods due to the magnitude of the reservoir it will create.[3738]

Mitigation is the key to balancing the need for water infrastructure and the need for a healthy, sustained environment. Egypt, Sudan, and Ethiopia have and will continue to implement mitigative measures, including emergency canals and irrigation systems, rehabilitation projects, and watershed management.[39] In such a water-stressed region, each state has its own infrastructure and aquifer considerations to take, and mitigation measures are integral to their sustainability.

C. Finding a Solution to the Problem: Past, Present, and Future

This topic charges the Council with both evaluating and mitigating the negative environmental impacts associated with water-related infrastructure and resource use, and the desalination industry. To address all parts of this topic, the Council should consider ways in which the shared environment is impacted by individual infrastructure projects, as well as the impacts typical of project types. Once the Council has determined the impacts it wants to address, determining mitigation policies and implementing them are the next steps. Resolutions created by this Council should be informed by the policies enacted by member states to mitigate the impacts of their water infrastructure and unsustainable use. The Council is encouraged to examine environmental mitigation efforts by other nations and organizations, such as the European Union, and to explore intergovernmental projects aimed at increasing sustainability and reducing degradation, such as those undertaken by the UNEP, UNDP, and the World Bank.

The Council might consider whether the League should address this topic by establishing a new framework, or utilizing an existing one, and whether the components of this topic should be addressed using a top-down, League-wide enterprise, or if it fits better as a bottom-up, state-by-state initiative. The Council might also utilize the resources already available to them, including the numerous research centers and universities spread throughout the League, and existing funds for sustainable development and other environmental purposes. The Council should focus on concrete steps League members can take towards evaluating and mitigating environmental degradation, with consideration for accountability, transparency, economic realities, and incentives.

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[37] Ibid.
[38] "Five Myths Surround the Grand Ethiopian Renaissance Dam." International Rivers. *International Rivers.* 30 January 2017. <link>.
[39] "Sedimentation Problems with Dams." International Rivers. *International Rivers.* 1996, 2017. <link>.

II. Questions to Consider in Your Research

- In what ways does my state get its water, and how do these methods impact its environment? Consider energy usage, changes in the water table, soil salinity and nutrients, and other factors.
- Do my state's water production and distribution activities have an impact on the environment beyond the borders of my state? How do other nations' water infrastructure projects impact my state?
- What types of mitigation techniques does my state implement to reduce negative environmental impact of water infrastructure, the overuse of resources, and/or desalination?
- What overarching environmental issues does my state face, and how does water infrastructure, the overuse of water resources, and/or desalination projects exacerbate or contribute to those issues? Does my state recognize those connections?

III. Questions a Resolution Might Answer

- Does the League have a role in bilateral or multilateral agreements concerning water resources? If it does, what does this role look like?
- How does the League overcome economic, political, or physical barriers to advanced mitigation techniques?
- What regulatory and mitigative practices are useful League-wide, and should the League ensure that mitigation is integrated into infrastructure plans? If so, how?
- How do members of the League, or the League as a whole, apprehend environmental degradation that crosses state borders?

IV. Additional Resources

- Sedimentation Problems With Dams
  This excerpt from book Silent Rivers *describes how sediment in rivers complicates dam efficiency, while also discussing mitigation measures to reduce sediment build up in dams to increase their efficiency as well as the health of the watershed. Though not specific to the region, it provides an infrastructure-centric view of river sedimentation and dam challenges.*

- The Impacts of Relying on Desalination for Water
  This article in Scientific American, while not specific to the MENA region, discusses the negative impacts of desalination, including the detriment to marine environments as well as the heavy consumption of fossil fuels.

- The Vanishing Nile: A Great River Faces a Multitude of Threats

This Yale publication discusses two major threats to the River Nile and the people who live along it: downstream saltwater intrusion and the Grand Ethiopian Renaissance Dam, upstream. The article provides political and economic context to these environmental concerns, as well.

- Hydropower Good Practices: Environmental Mitigation Measures and Benefits (IEA)
  This International Energy Agency (IEA) document compiles best practices for the mitigation of hydropower projects. The report is careful to note that mitigation must be "tailor-made." or specific to individual projects, states, and regions. This document may provide context to the variety of mitigation techniques available to states utilizing hydropower, dams, and other water-related infrastructure.

Topic 4: Assessing the feasibility and benefits of recycling and waste disposal programs to increase materials and water recovery, and decrease energy use.

I. Introduction

A. General Background

This topic focuses on recycling and waste systems. It asks the Council to consider ways in which these programs might be implemented in order to increase recovered materials and water and to decrease energy use overall. Recycling is simply defined as the process of converting waste materials (anything that is or would be thrown away) into "new" materials suitable for further use. Waste disposal includes recycling, of which wastewater treatment is a subset.

Recycling programs have largely been the product of necessity. During times of economic depression or war, governments and the citizenry have rallied behind systems that allow them to extend the life of material.[40] By nature, recycling helps cut down on resource extraction and production, which has a rippling effect: by reducing the need for new materials, natural resources are conserved, pollution due to mining, logging, etc. is prevented, greenhouse gas emissions may be reduced, and the need for landfills and waste combustion facilities are reduced. All of these benefits bear on the environment as well as the economy.[41]

Wastewater treatment systems are a type of recycling, which aim to reduce the waste of water as opposed to solid material. Both residential wastewater and industrial wastewater can be treated, with varying levels of reusability. Treated wastewater, known as effluent, is most commonly

[40] Bradbury, Matt. "A Brief Timeline of the History of Recycling." *Busch Systems Resource Center.* 20 May 2014. <link>.
[41] "Recycling Basics." Environmental Protection Agency. *US EPA.* 5 Aug 2017. <link>.

reused in agricultural settings. Some wastewater systems are meant to simply reduce pollutants and bacteria before the effluent is dumped, often into a nearby body of water.[42]

Solid waste disposal systems tend to be less environmentally-friendly, and contribute heavily to greenhouse gas emissions and other types of pollution – but they are necessary. Early waste disposal consisted of burying or piling trash, creating mounds of foul, rotting garbage that not only was aesthetically displeasing, but contributed heavily to the production of methane, and to seepage – when untreated liquid infiltrates groundwater systems and introduces pollutants and harmful bacteria to otherwise potable water. This system still exists, and we know these waste piles as "landfills." Most modern landfills are carefully planned and constructed, resulting in less risk of environmental degradation.[43] Another common type of waste disposal is incineration – burning trash. Waste incineration, also known as combustion, can release toxic pollutants into the atmosphere, including greenhouse gases and heavy metal pollutants such as lead and mercury.[44] Though harmful, it is important to remember that waste disposal processes are necessary; because of the importance of sanitation and waste disposal, many states and intergovernmental organizations prioritize initiatives, campaigns, and research centered on sanitation and waste.

B. History in the Arab World

Waste management systems in the Arab world vary greatly from country to country, sometimes due to financial necessity, but also due to availability of technology or the percentage of the population that is rural versus urban. Understanding the variety of recycling and disposal systems within League states, and exploring how they have developed, is imperative to fully discussing this topic.

In Sharjah, an Emirate of the UAE, one environmentally-focused company is transforming the Emirate into a recycling capital - as of 2015, seventy percent of waste in Sharjah was recycled. Bee'ah, the environmental firm, has a goal of zero waste, and they have also created one of the largest waste-to-fuel sites utilizing biogases in the world. This type of technology is common among other states and regions, but the scale to which Bee'ah is utilizing biogas is notable.[45] Bee'ah attributes their success with mass recycling not only to the technology they use, but to

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[42] "Wastewater Reuse in Arab Countries." ACWUA Working Group on Wastewater Reuse. *ACWUA.* March 2010. <link>.
[43] "Learn about Landfills." Advanced Disposal. *Advanced Disposal Systems, Inc.* 2017. <link>.
[44] National Research Council. "Understanding Health Effects of Incineration." *Waste Incineration and Public Health.* National Academies Press. 2000. <link>.
[45] Callear, Charlotte. "The Middle East's most advanced recycling system." *The Telegraph.* 1 December 2015. <link>.

their efforts to work collaboratively with the government in a public-private partnership, and also to their commitment to environmental education, beginning with school children.[46]

The importance of public-private partnership, as evidenced in the UAE, is echoed by other states as well. Morocco's waste management systems, for example, incorporate private entities to help manage large components of the disposal system.[47] Morocco has prioritized its waste disposal system over the last decade, partnering not only with private companies within the state but also with intergovernmental organizations such as the World Bank.[48] Morocco plans to increase the percent of waste recycled to 20% by 2022.[49] Other states are hindered by technological, geographical, or political obstacles. In Lebanon, mismanagement of solid waste has amounted to a "garbage crisis," where the streets of Beirut are lined with garbage, and the Mediterranean coastline is covered with waste and dead marine life.[50] Members of civil society point to the government's attempts to reduce costs by "cutting corners" on waste management.[51]

Wastewater treatment and reuse is similarly varied through the League. The Arab Countries Water Utilities Association (ACWUA) is an exchange platform and advisory group which researches water and wastewater technology and trends and provides support to members. Most members of the League have private or public entities as members of the Association, which is based out of Jordan.[52] In a 2010 report, ACWUA describes that wastewater systems depend heavily on the geography and economy of a state, and further on the political will and capacity to create and enforce wastewater treatment and reuse parameters.[53]

C. Finding a Solution to the Problem: Past, Present, and Future

There is a wealth of knowledge about waste disposal and recycling, and a patchwork of systems and policies across the League. Given the importance of the topic and the different needs of all states, how can the League emphasize the benefits of recycling while considering the feasibility of a League-wide measure?

League members have taken different approaches to this topic. As mentioned previously, the type of waste management systems employed by a state is dependent on the economy (both its strength and its main sectors), the geography, including proximity to a major body of water and

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[46] Ibid.
[47] "Waste Management Key to Regaining Public Trust in the Arab World." The World Bank. *World Bank Group.* 14 March 2016. <link>.
[48] Ibid.
[49] Ibid.
[50] Jay, Martin and Ruby Russell. "Lebanon garbage crisis pollute Mediterranean." DW. *Deutsche Welle.* 14 June 2017. <link>.
[51] Ibid.
[52] "Members List." Arab Countries Water Utilities Association. *ACWUA.* 28 December 2016. <link>.
[53] Rothenberger, Silke. "Wastewater Reuse in Arab Countries." *ACWUA.* March 2010. <link>

the distribution of the population, and the political support for waste systems. Some have turned to international or intergovernmental organizations, such as the World Bank, UNEP, or the European Union to provide expertise, funding, and political support. Others have internalized the process, improving their systems by partnering with the private sector and running mass education campaigns about the importance of recycling or responsible waste disposal. The League should consider whether individual approaches to waste management are implementable on a League-wide scale.

The League might consider adopting the recommendations of working groups, individual states, or inter- and non-governmental organizations, such as the ACWUA, when considering how to improve the quality and feasibility of waste management systems throughout the region. While addressing the topic and achieving its aims, the Council should remain cognizant of the purview and limitations of this Council and of the League, and attempt to work with existing structures in addition to new or novel initiatives.

II. Questions to Consider in Your Research

- Does my state prioritize recycling of solid waste and water? Why or why not?
- Why has my state chosen the type(s) of waste disposal technology is employs? What limitations impacted that decision?
- How can my state improve its own waste disposal and recycling systems? Does my state have plans to expand or shrink this sector, and if so, why?
- What limitation or advantages does my state have concerning waste disposal and recycling? Is my state able and willing to overcome those challenges, or conversely, to exploit those advantages?

III. Questions a Resolution Might Answer

- Why should the League be involved in waste disposal and recycling programs, which typically occur on a state-level?
- What supranational organizations, conventions, or norms are at play in this topic, and should the League work with(in) them? If so, how?
- Should the League implement any new programs or initiatives? If so, what should they do, and how will they be funded?
- How does the League intend to stabilize and make sustainable the waste disposal and recycling industries? What are the long term fixes to the overarching issues in this topic, and what role does the League play?

IV. Additional Resources

- Wastewater Reuse in Arab Countries

This report, compiled by ACWUA's working group on wastewater, discusses the various challenges states face in reusing treated wastewater, provides statistics on several League members, and prescribes recommendations to Arab states concerning wastewater treatment and reuse.

- Solid Waste Management in The Middle East - Major Challenges
  This article published by EcoMENA describes some of the major challenges MENA must overcome to have effective waste disposal and recycling programs. In the discussion of this topic, it also provides recommendations. This article is one of many EcoMENA has published on waste disposal and recycling; their website also includes country-specific analyses of waste management.

- United Nations Waste Treatment and Disposal Measurement Standards
  This document discusses how the United Nations defines waste management and disposal, and explains how it can be measured. Though the UN's methodology may not be as relevant to the League, the definitions provided in this document may be useful to members of the Council and to the League.

- Solid waste characterization, quantification and management practices in developing countries. A case study: Nablus district – Palestine
  This article is a case study of solid waste disposal in Palestine. Palestine faces a number of challenges to safe and efficient waste disposal, and the authors suggest that the recommendations and findings are applicable to other developing nations with significant political and material limitations to providing public services.