2019-2020

Model Arab league

BACKGROUND GUIDE

Council of Arab Environmental Affairs Ministers

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Original draft by Henry Choisser, Chair of the Council of Arab Environmental Affairs Ministers at the 2020 National University Model Arab League, with contributions from the dedicated staff and volunteers at the National Council on U.S.-Arab Relations

Honorable Delegates,

I am incredibly excited to welcome you to the 2019-2020 season of Model Arab League! My name is Henry Choisser, and I am honored to be your Chair for the Council of Arab Environmental Affairs Ministers at the 2020 National University Model Arab League. I am a senior at Northeastern University, majoring in International Affairs and minoring in Mechanical Engineering, International Security, and Russian. This will be my 5th year attending Nationals, and I am looking forward to it being the best one yet. My experiences on the Arab League circuit have provided me with incredible experiences and friends, as well as some of the most valuable skills in life. By taking part in this conference you will be practicing emotional empathy as you place yourself in the perspective of those who hold different world views, fast pace multitasking as you keep up with the flurry of debate and resolution writing, as well as diplomatic composure while debating people with whom you fervently disagree. Because of Model Arab League I have made lasting friendships, expanded my professional network, and found interests in areas I did not previously know existed. I wholeheartedly believe that if you invest yourself in the rigor and open-mindedness of this program that you will reap similar, if not greater benefits. It is my sincere hope that you do.

I am glad that you chose to be a part of one of the most important committees in the League of Arab States. Unlike some committees that can become pigeonholed into discussions focusing on one or a handful of states, ours is dedicated to a shared treasure – Earth and her environment – meaning that one of the unique aspects of the Council of Arab Environmental Affairs Ministers is that our work has positive tangible implications for every member state and all the citizens therein. Unlike the narrower scope of some committees, ours has the potential to improve the lives of hundreds of millions of men, women, and children.

I know that you are eagerly awaiting the conference itself, but your preparation ahead of time is the key to your success once you arrive. I find the best way to contribute to debate is having a deep understanding of how your delegation - your country - stands on every single one of these topics. Is your country for or against the existing policies on this topic? What is your country doing regarding the topic? Go beyond a simple Google search; use news articles, the CIA World Factbook, UN reports, scientific papers, government websites, and other knowledgeable sources for your research. Although you are coming here to compete and collaborate, do not forget that you are representing a certain delegation and country's worldview and national interests – not your own. Although the ideas will be your own, they should not escape the bounds of reality. Ask yourself if you could see your country taking this stance in a news article.

I know debate can become very intense, but I expect diplomacy and mutual respect among delegates. Remember that this is a learning experience for everyone, make sure to give your peers that opportunity. However, I have no doubt that you will exceed this and be kind, friendly, and open-minded – helping one another learn together.

I am looking forward to meeting you all, seeing what creative and innovative solutions you bring to Nationals, and wish you luck during your journey this season. Remember that this is meant to be, above all, a fun experience!

Best of luck ahead,
Henry

Topic I: Assessing methods and policies that can improve the market for renewable energy and other forms of sustainable infrastructure development within the Arab League.

I. Introduction

A. General Background

The global demand for energy increases unceasingly with population growth and economic development at approximately 1.8% annually.[1] Since 2014, a narrow majority (66% in 2018) of new power generation capacity being developed around the world is drawn from renewable sources.[2] Yet the subsidization of renewable energy projects lags far behind the continued subsidies for the fossil fuel industry: The IEA calculates that the global subsidy bill for fossil fuels stood at about $490bn in 2014. On the other hand, subsidies to aid the deployment of renewable energy technologies were $112bn in 2014, with another $23bn spent on supporting biofuels.[3] So, while many developed countries are increasing financial backing for the expansion of green energy supplies, total subsidy support for "dirty" fuels across the world still exceeds that for renewables by a considerable margin.

However, reduction in the cost of renewable energy vis-à-vis traditional fossil fuels has spurred increased spending on renewable energy production. 2018 marked the first year that the cost per megawatt hour (MWh) of power from new wind or solar power generation was cheaper than from fossil fuels. From a price perspective, onshore wind has become the world's lowest-cost energy source for power generation, with an unsubsidized price range of $30–60 MWh, which falls below the range of the cheapest fossil fuel, natural gas ($42–78 per MWh).[4] With that in mind, one of the main impediments to a burgeoning renewable energy market is the capacity and strain on national electric grids – effective energy storage remains one of the most difficult hurdles of switching to renewables as a predominant energy source. This is due to renewable's nature of producing high volumes of power when the conditions are right and almost none when they are wrong. Not only does the grid need to be able to store that power for a lull in production, but also be capable of storing that amount of energy without becoming damaged.

Additionally, sustainable infrastructure is not limited to simply building hydroelectric dams and solar farms, it includes sustainable water management, more efficient power grids and irrigation systems, green architecture, environmentally friendly urban planning, and a re-use/recycle mentality (one that has driven developments like the UAE's new road network project using recycled rubber asphalt to build public roads).[5]

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[1] (https://www.iai.it/sites/default/files/menara_wp_21.pdf)
[2] https://sdg.iisd.org/news/in-2018-66-of-new-electricity-generation-capacity-was-renewable-price-of-batteries-dropped-35/
[3] (https://www.ft.com/content/fb264f96-5088-11e6-8172-e39ecd3b86fc)
[4] (https://www2.deloitte.com/insights/us/en/industry/power-and-utilities/global-renewable-energy-trends.html)
[5] (https://meconstructionnews.com/34650/uae-launches-road-network-project-using-recycled-rubber-asphalt)

B. History in the Arab World

Compared to the rest of the world, Arab League (AL) member states have been slow to adopt renewable energy sources as integral parts of their energy economy. In 2017, Europe and the U.S. each invested over $40 billion in renewable energy, China meanwhile invested $126.6 billion. Whereas just over $10 billion has been allocated in the Middle East and the whole of Africa.[6] This gap can be attributed to more than just the developing nature of the region – long nationalized energy sectors have been slow to adopt change at a market-set pace, and the bureaucratic limitations on private investment opportunities have made sources of foreign loans and venture capital scarce. Likewise, the abundance of fossil fuels in the most economically developed states have made it difficult to muster the political will to make the necessary investments in sustainable infrastructure. That being said, developing large scale renewable energy capabilities is a critical next step for the MENA region for a variety of reasons, even well beyond the dire need to reduce our global carbon footprint by midcentury. For fossil fuel rich countries like the Gulf states, Libya, and Algeria that export energy the benefits of a strong renewable energy sector are twofold: escaping the resource trap before the most economically viable sources of fossil fuels are depleted and improving their net gains by selling fossil fuels internationally at market prices rather than subsidizing cheap energy for their citizenry. For energy importing countries in the League, it is important to develop domestic energy supplies to reduce the danger of market volatility and the future costs of rapidly urbanizing populations that demand more electricity.

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

The Pan-Arab Renewable Energy Strategy 2030, adopted by the Arab League Heads' of State in 2013, puts it succinctly: "States need to improve institutional frameworks, upgrade grid infrastructure, ensure the availability of finance and build the skilled workforce for accelerated renewable energy deployment."[7] Integrating grids has the possibility of reducing the strain on any one localized grid, increasing the ability to store renewable energy whose output is weather and time-of-day dependent. Moreover, the League must be prepared to navigate the legal environment in a way that takes into account local partners, the company structure, availability of materials, availability of labor, requirements to hire and train the local labor force, as well as the usual myriad of other issues which may affect any investment, such as licensing, taxes, custom' duties, the ability to expatriate monies, and permitting, to name just a few. Jordan's April 2012 passage of the Renewable Energy and Energy Efficiency Law (REEL) together with more recent amendments have created some of the most complete legislation for renewables in MENA. There is a set tariff structure, and requirements for the National Electric Power Company to purchase the output and to fund grid connection for larger projects. REEL also allows investors to propose renewable

[6] (https://themedialine.org/by-region/uae-saudi-morocco-egypt-lead-renewable-energy-race-in-middle-east/)
[7] (http://www.rcreee.org/sites/default/files/irena_pan-arab_strategy_june_2014.pdf)

energy projects, a rare attribute in the region, thereby allowing early investors to benefit from government support and assistance to deal with both common investment issues such as land ownership rules, company ownership rules, tax issues, etc., and also industry specific issues such as grid connections and tariffs. Going forward, the League must be prepared to improve the investment climate if real progress toward sustainable infrastructure and energy is to be realized.

II. Questions to Consider in Your Research

- What is my country's relationship to the fossil fuel industry, and what are my economic incentives to adopt change?

- What kinds of renewable energy are most likely to be productive in my country (i.e. do I have sunny deserts, windy mountains, flowing rivers, or geothermal activity nearby)?

- What economic capacity, skilled labor, or infrastructure does my country have to implement the ideas espoused above?

- Are there any projects that my country has previously undertaken that could be expanded or exported to other parts of the League?

III. Questions a Resolution Might Answer

- What balance can be struck between a league-wide approach to solving the issue, and the wide variety of economic situations and conflicts ongoing throughout the MENA region?

- Should renewable energy sources be connected to transnational grids to improve the capacity of the systems to handle the large fluctuations in energy output inherent to renewable sources?

- Should private industry be further integrated into the energy production sector to reduce the costs of installation, upkeep, and management?

- To what extent should renewable energy be prioritized (in terms of subsidization) vis-à-vis the fossil fuel industry that has fueled the economic growth of many states in the region?

IV. Additional Resources

- http://web.worldbank.org/archive/website01418/WEB/0__CO-46.HTM
  A short World Bank overview of energy production in the middle east that provides highlights and important statistics
- global energy subsidy map
  An easy to view map that gives a clear picture of the extent of fossil fuel subsidies around the world
- http://www.rcreee.org/sites/default/files/irena_pan-arab_strategy_june_2014.pdf
  Documentation of League strategy that can be used as a springboard for ideas, especially where your research shows gaps or unfulfilled goals
- https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Jan/IRENA_Market_Analysis_GCC_2019.pdf
  Strong analysis of the renewable energy market in the GCC, where some of the greatest potential for renewable energy investment exists in the region
- https://www.vox.com/energy-and-environment/2019/6/18/18681591/renewable-energy-china-solar-pv-jobs
  Informative article that makes the global renewable energy market and situation into layman's terms, with good visuals
- https://www.lazard.com/media/450337/lazard-levelized-cost-of-energy-version-110.pdf
  Study by Lazard that compares the cost of energy by source based on real market data
- https://www.apricum-group.com/the-mena-region-the-next-hot-market-for-energy-storage/
  Explanation of the complexities of producing and storing enough renewable energy to power a modern economy

Topic II: Discussing ways to combat desertification and deforestation as a result of climate change, agriculture, and resource extraction, particularly as a means of establishing sustainable practices heading into a more water scarce future.

I. Introduction

A. General Background

The Millennium Ecosystem Assessment (2005) described the phenomenon of desertification as the "long-term failure to balance demand for and supply of ecosystem services in drylands."[8] The paradox is that despite ever-increasing demand for land, more than 10 million hectares (38,600 sq. miles) of arable land turns into desert every year.[9] The major culprits responsible for desertification apart from climate change are deforestation, overgrazing, unsustainable cultivation methods (i.e. denitrification), and poor irrigation practices. Drylands are water scarce biomes that still support fragile ecosystems. Rangelands include those covered by natural grassland, shrub-lands and a combination of both. These ecosystems are just as important as forests in the fight against desertification.[10] For their part, mangroves and marshlands are important for preventing the salinization of coastal groundwater (which can lead to desertification or non-arability in the land as well). The negative externalities of desertification result in decreased agricultural yields, loss of biodiversity, poverty, reduced human wellbeing, and migration, the latter three of which have the propensity to cause conflict in an already unstable region that is becoming more stressed. Deforestation damages the water table by reducing the amount of water retained near the surface and also reduces the quality of nearby water by increasing the runoff that is able to reach source water such as lakes, rivers, and streams. Unfortunately, the UN Convention to Combat Desertification (UNCCD 1994) is the sole legally binding international agreement linking environment and development to sustainable land management. The World Bank report, *Turn Down the Heat* describes the ways that climate change can impact desertification: "An increase in temperatures and evapotranspiration rates, a change in the precipitation regime, and an intensification or change in frequencies of extreme events can all directly trigger or enhance desertification processes." Climate extremes (an increasingly frequent occurrence) can likewise push drylands over the brink into desertification.

B. History in the Arab World

The Middle East and North Africa are home to 6.3% of the world's population, but have access to barely 1.4% of the world's renewable freshwater. The average water availability per person in other geographical regions is about 7,000 m^3/year, whereas water availability is a mere 1,200 m^3/year in the MENA region. According to the World Bank, the current average water usage per

[8] (https://www.researchgate.net/publication/40119375_Millenium_Ecosystem_Assessment_Synthesis_Report)
[9] (https://www.ecomena.org/desertification/)
[10] (https://themediaexpress.com/2016/10/08/forestry-and-forest-management-in-the-middle-east/)

capita in the MENA region is 804 m^3/year.[11] If left unabated the average water availability per capita could drop to as low as 200m^3/person/year. Middle East countries have the least efficient per capita consumption of water in the world with an estimated 40-50% leakage in urban systems and 50% of agricultural water failing to reach crops as intended. An additional 48.6% of the land area in the Mashreq, 28.6% in the Nile Valley and the Horn of Africa, 16.5% in North Africa and 9% the Arabian Peninsula is endangered on account of desertification.[12] Around 85% of the water in the MENA region is used for irrigation. This level of irrigation is inherently unsustainable and leads to overuse of scarce renewable water resources, which in turn results in increased groundwater salinization. MENA's average water use efficiency in irrigation is only 50-60%, compared to best-practice examples of above 80% efficiency under similar climate conditions in Australia and the Southwest United States. Similarly, physical water losses in municipal and industrial supplies in the region are far above world averages.[13]

Farming industry around the Arab League has a history of using water intensive crops in agriculture, thus compounding the issue of aquifer overuse and regional water scarcity. Likewise, the abundance of large and unsustainable irrigation systems to grow crops contributes to the extensive water mismanagement that taxes the water resources of the region. The MENA region reports the highest loss of freshwater in its food supply chain: some countries lose from 80 to 177 m^3 per capita of freshwater resources in the food supply annually. At the same time, MENA does not collect half of the wastewater and returns 57% of the collected wastewater to the environment untreated, causing health problems and high level of wasted water resources.[14] Agriculture consumes up to 87% of the total water resources used around the MENA region on a yearly basis; thus reform in the laws and business practices surrounding agribusiness and water management has the propensity to have a major impact on the water scarcity and stability of the region in the future.[15]

Despite its scarcity, the region has the world's lowest water tariffs and the highest proportion of GDP (approximately 2%) is spent on public water subsidies. Moreover, the region has the greatest expected economic losses from climate-related water scarcity. In 2016, the World Bank estimated that MENA will lose 6-14% of its GDP by 2050 as a result of water scarcity due to climate change.[16] This is partly due to the fact that many countries continue to incentivize high water usage through low water pricing that woefully misrepresents the supply versus demand of local water resources.[17] The majority of those resources in the Arab League are held in aquifers that cross one

[11] (http://siteresources.worldbank.org/INTMENA/Resources/App-all-Scarcity.pdf)
[12] (https://www.ecomena.org/desertification/)
[13] (https://www.ecomena.org/water-scarcity-in-mena/)
[14] (https://reliefweb.int/report/world/water-stress-poses-greatest-threat-mena-region)
[15] (http://web.worldbank.org/archive/website01418/WEB/IMAGES/WP47WEB.PDF)
[16](http://documents.worldbank.org/curated/en/317301468242098870/pdf/927040v20WP00O0ull0Report000English.pdf)
[17](https://www.ecfr.eu/publications/summary/how_water_scarcity_could_destabilise_the_middle_east_and_north_africa)

or more national borders, compounding the need for a league-wide approach to mitigating water scarcity. Aquifers stretched beneath Saudi Arabia and Yemen rank first among 'overstressed' aquifers followed by the Murzuk-Djado Basin in North Africa.

Rapid population growth and urbanization continue to be a problem in regard to water usage, due to the on average higher water consumption of city-dwellers vis-a-vis their rural peers. Simultaneously, these growing cities are facing increasing water shortages, often compounded by the effects of climate change, and insufficient sanitation capacity with high exposure to contaminants.[18] The stresses caused by a surging population overwhelmingly stem from the mismatch of existing infrastructure to population density. This equation can be seen in an unexpected but parallel source of desertification that has resulted from the plethora of refugee camps around conflict zones and years of damage to local infrastructure. An estimated 64,700 acres (101 square miles) of forest and shrubland are burned each year simply for the purpose of providing energy for heat and cooking by forcibly displaced persons - armed forces around Idlib have even issued statements condemning cutting down trees after seeing the toll it was taking on the local landscape.[19]

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

In 2011, the Arab Ministerial Council issued its Water Security Strategy, a document that demonstrated the scale of the challenge and outlined a region-wide joint framework to address water scarcity[20]Given the absence of reliable water resources throughout the region, robust and equitable water sharing agreements present a politically fraught, but pragmatic facet of the creative solutions the League will need to develop if the current water crisis is to be prevented from becoming a region-wide water emergency. This is especially true for transnational watersheds and aquifers as tensions caused by resource competition in the not-too-distant future are likely to make a future political solution even harder to find. Additionally, the further implementation of "grey water" recycling (treatment of water reclaimed from what would otherwise be wastewater), for purposes other than human consumption, has the distinct possibility of alleviating the stress on limited potable water resources. Other forms of non-conventional water (NCW), such as slightly salinized groundwater, can be used for agricultural production. These NCWs exist in greatest quantity in the hinterlands of urban areas. Other aspects of water management schemes may include holistic approaches to managing both water demand and supply, as well as contingency plans that can meet future challenges. Any such mechanisms enacted by the League must take into account geographical, economic, and demographic differences among member states when formulating water policies.

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[18] (http://www.fao.org/3/a-i2616e.pdf)
[19] (https://syriauntold.com/2018/07/17/displacement-and-the-environment-lessons-from-syria-and-the-middle-east/)
[20](http://www.reviewbooks.site/Arab_Strategy_for_Water_Security_in_the_Arab_Region_to_meet_the_Challenges_and_Future_Needs_for_Sustainable_Development_-_2010-2030.pdf)

One of the keys to any effective water scarcity solution will be better management of agricultural water usage, be that through more efficient crops, irrigation, or recycling practices. Some states have passed national water resource plans, but more work will need to be done in this regard, including at a transnational level. All of these measures must work in tandem to preserve the water table and prevent soil erosion – both contributors to the ecological phenomenon of desertification. Likewise, with per capita water consumption set to outpace per capita water resources in the coming decades, public education about personal water use will become a necessity.

Subsidies and incentives have played a critical role in leading agricultural development and growth in the region, but they have also resulted in environmentally unsustainable and inefficient use of a scarce resource. They have led to market distortions, excessive use of groundwater for irrigation and a high fiscal burden on the state institution that provides the water. These incentives have served the agriculture sector well in adopting improved technologies and introducing new crops. The sector may have needed subsidies and protection to attain some economies of scale to become internationally competitive in the past – however, agriculture has become a more mature sector that needs to improve efficiency further. Reduction of some subsidies, and possibly phasing out other subsidies, such as for irrigation, would reduce the rate of aquifer depletion to a more sustainable level. Targeting price subsidies could likewise encourage productivity gains in the sector by promoting a shift towards crops that are more efficient in their net water to yield ratios. All options must be weighed if a crisis is to be averted. As a League, we must have a focus not only on protecting what arable land remains, but also on re-greening drylands to help forestall the inevitable increase in desertification as the earth warms and the climate becomes even more unstable.

The threat of desertification is a global problem, with solutions being developed around the world - look not only at practices concurrently used within the Arab League as you seek to solve this issue. China's Junaco technology has increased the income of farmers in the Ningxia province nearly ten-fold since 1990, and even if the technology is proprietary or inapplicable to the Arab League it may benefit the committee to look for opportunities to learn and adapt strategies from abroad to serve our own needs.[21] Holistic grazing practices have likewise seen incredible success in preventing and reversing some early stages of desertification when implemented properly, though the application of these techniques would require strong partnerships and education programs to teach herders how to manage their land better.[22]

II. Questions to Consider in Your Research

- How likely is my country to be negatively impacted by the phenomenon of desertification, and what impact will it have on the economy?

[21] (http://sdg.iisd.org/news/un-projects-tackle-desertification-in-the-mid-east-asia-and-africa/)
[22] (http://desertificationmiddleeast.weebly.com/problem-solving.html)

- How does sovereignty apply to groundwater resources that span across multiple countries?
- What are the largest contributing factors in my country to the plight of desertification? Are they ones that can be solved domestically, or do they require help from the League as a whole to be overcome?
- What measures are other countries outside of the Arab League taking to adapt to, forestall, or remediate the expansion of desert environments? Can these measures be adopted for my or other Arab states?

III. Questions a Resolution Might Answer

- Should water sharing agreements be discussed on a league wide, regional, or bilateral basis?

- Which countries have the greatest responsibility to share their relatively larger water resources with less well-off members?

- Do states with greater technological capabilities to extract those water resources have a right to take what they can, even if it depletes another nation's future access to water?

- What role should the public play in better managing the limited resources available, especially as the per capita water availability continues its precipitous decline?

IV. Additional Resources

- http://www.reviewbooks.site/Arab_Strategy_for_Water_Security_in_the_Arab_Region_to_meet_the_Challenges_and_Future_Needs_for_Sustainable_Developme nt_-_2010-2030.pdf
  Document that illustrates the preexisting Arab Strategy for Water Security, which you can either seek to implement where it is not currently, or take inspiration from for your own proposals
- http://publications.iwmi.org/pdf/H048385.pdf
  "*Groundwater Governance"- overview of the legal aspects of transnational underground water sources*
- https://www.iucn.org/sites/dev/files/global_pact_regional_review_-_league_of_arab_states.pdf
  Analysis of which existing legislation in the Arab League that clearly illustrates where the League has already implemented aspects of the Global Pact for the Environment (adopted by the UN), and where regulations have yet to be set up in accordance with it
- http://web.worldbank.org/archive/website01418/WEB/IMAGES/WP47WEB.PDF

A slightly older but still very informative document on the region's relationship with water, agriculture, and food security

Topic III: Developing a League-wide framework to reduce plastic production, distribution, consumption, and disposal throughout the Arab League from both domestic and international sources.

I. Introduction

A. General Background

The first synthetic plastic — Bakelite — was produced in 1907 and is said to mark the beginning of the global plastics industry. However, the current exponential growth in global plastic production was not realized until the 1950s. Over the following 65 years, annual production of plastics increased nearly 200-fold to 381 million tons in 2015. Of the estimated 8,300,000,000 (8.3 billion) tons produced in the modern era approximately 6.3 billion tons have become discarded plastic waste – much of it circulating through the world's oceans (~80%) and terrestrial environment (~20%).[23] Plastic production's meteoric rise has increased unceasingly apart from a small dip in 2008. Furthermore, in 2015, an estimated 55% of global plastic waste was discarded, 25% was incinerated, and 20% recycled. Plastics used in packaging make up the bulk of global plastic production (146 million tons), nearly tripling the next highest source, building and construction (65 million tons). However, whereas only 21% of plastic used in building and construction results in waste, an astounding 96.5% of packing plastic ends as waste.

The threat of rampant plastic pollution has been heightened by China's 2018 ban on plastic waste imports. As the world's former largest importer of recycling and waste, the resulting global shift in waste trading has left small countries in Southeast Asia to take the brunt of dumping (both recycling and trash) by multinational corporations that shunt waste formerly sent to China onto these smaller countries. Although the majority of recycling exports have shifted to Southeast Asia it is important that the Arab League take action now to prevent the future development of black market landfills and recycling facilities that can have a deleterious effect on human health and the local environment if improperly managed.[24] Additionally, the 2018 OECD report on global plastic management explains the relationship between plastic production and greenhouse gas emissions; traditional plastics production involves the transformation of petroleum or natural gas into their constituent monomers (molecules that can be bonded to other identical molecules to form a polymer.). This process is highly energy-intensive and was estimated to account for 400 million tons of greenhouse gas emissions annually (around 1% of the global total).

According to informed sources, the global plastic waste management market is expected to grow at an annual rate of ~3% during the current forecast period (2019-2023). Yet if the global trends

[23] (https://ourworldindata.org/plastic-pollution)
[24] (https://www.scmp.com/news/china/politics/article/3007280/how-chinas-ban-plastic-waste-imports-became-earthquake-threw)

hold, plastic production will increase by another 10-14% over that same time.[25] Furthermore, in their 2019 report, Plastic and Climate, the Center of International Law notes that "if the expansion of petrochemical and plastics production continues as currently planned", by 2050 plastic will be responsible for 10 to 13% of the total "carbon budget" (which is the amount of CO2 we can emit globally and still remain below a 1.5 degree Celsius temperature rise).[26]

Once thought impervious to decomposition, evidence has arisen that shows plastics are in fact subject to chemical breakdown in the world's oceans and at surprising speeds, and at much lower temperatures than previously thought possible. This is no reason to rest easy, however, as the decomposition of various polymers (accelerated by salt water and solar radiation) used in many common plastics produce numerous chemicals that are toxic to marine life, namely bisphenol A (BPA) and PS oligomer. Furthermore, these toxins, as well as microplastics that develop during the breakdown, enter the food chain at all levels - from plankton to fish to whales - and persist all the way up the chain until they reach our own dinner tables, introducing a poorly studied, but undoubtedly unhealthy element into the human diet.[27] This facet of the larger discussion about plastic waste may be of particular interest to member states that have a large fish based diet (such as many of the Gulf states). Moreover, marine wildlife is harmed through ingestion of plastics or entanglement, with negative implications for ecosystem health and the overall sustainability of fisheries. According to the National Oceanographic and Atmospheric Administration, plastic debris kills an estimated 100,000 marine mammals annually, as well as millions of birds and fish.[28] Coastal tourism is also affected as travelers seek to avoid beaches known to have high concentrations of plastic litter. That being said, there are other clear and well-known correlations between plastic incineration and severe negative health outcomes that come with the inhalation of the resulting fumes, which are extremely carcinogenic. Even worse, for many developing nations with poor recycling and waste management infrastructure, incineration is a default method of controlling waste overflow from landfills and other containment sites that are severely lacking in capacity, particularly as a result of increasing urbanization.[29]

B. History in the Arab World

Collectively the Arab League produces more than 8% of globally mismanaged plastic waste even though it produces less than 8% of global plastics - meaning that plastic waste management throughout the League is lagging behind a world that is already struggling to manage its plastic (mismanaged waste is defined as waste that is not properly disposed of and includes storage in dumps or open/uncontrolled landfills, where it is not fully contained).[30] According to a 2009 study,

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[25] (https://www.marketwatch.com/press-release/plastic-waste-management-market-2019-global-analysis-segments-size-share-industry-growth-and-recent-trends-by-forecast-to-2023-2019-02-01
[26] (https://www.ciel.org/wp-content/uploads/2019/05/Plastic-and-Climate-FINAL-2019.pdf)
[27] (https://www.sciencedaily.com/releases/2009/08/090819234651.htm)
[28] (http://plastic-pollution.org/)
[29] (https://www.ciel.org/news/plasticandhealth/)
[30] (https://ourworldindata.org/plastic-pollution)

in many countries up to half of all waste generated may be left completely uncollected, especially in remote and rural areas. [31] Even as of 2016, nearly 50% of all plastic pollution was mismanaged across the Middle East and North Africa - posing major long term health, environmental, and economic risks to the region. Primitive methods of disposal are still practiced in some parts of the region, including open dumping and burning, as well as mixing of municipal with industrial and medical wastes when disposed of.[32] The statistics have improved slightly since 2009, yet the underlying problem - a lack of institutionalized waste management schemes, especially in rural areas (and even major cities) - remains the same (exemplified by the years long trash epidemic that has plagued Beirut, and which peaked in 2015 with waves of anti-government protests).[33] In many countries, waste management is the sole prerogative of state-owned companies and municipalities which discourages participation from private companies and entrepreneurs. Thereby stifling the necessary innovation and cost efficiency needed to overcome the current dearth in collection rates and organizational capacity.[34]

Any effective waste management system requires a high degree of public participation, robust laws, sufficient funds, and modern waste management techniques. Many countries lack the legislative framework and regulations to deal with proliferating waste. Insufficient funds, absence of strategic waste management plans, lack of coordination among relevant stakeholders, shortage of skilled manpower and deficiencies in technical and operational decision-making are some of the hurdles experienced in implementing an integrated waste management strategy in the MENA region.[35] Additionally, the mounting costs to tourism via the contamination of pristine beaches is estimated to be in the billions of dollars across the Arab world.[36] Since 2016, the market value of the packaging sector in the Middle East has nearly doubled - from about $42 billion to $73 billion (tripling market forecasts for growth). Any measures taken by the League must account for the rapid and ongoing expansion of plastic producing industry in the region; simply accounting for the status quo will not be sufficient.[37]

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

Saudi Arabia, Jordan, and Egypt, among others, had previously built a handful of waste treatment and recycling plants over the last 20 years. However, Technical defects, improper management, and faulty procedures resulted in the facilities being shut down after only a few years. Going forward we do not have the luxury of time to repeat these mistakes – unfortunately, regional expertise is often lacking in this regard.[38] A place to begin a league-wide framework may be found

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[31] (https://www.statista.com/statistics/585820/percent-of-plastic-waste-mismanaged-middle-east-africa-by-type/)
[32] (https://www.ecomena.org/tag/plastic-recycling-in-middle-east/)
[33] (https://www.progrss.com/sustainability/20180312/trash-crisis-lebanon-innovation/)
[34] *(https://www.bioenergyconsult.com/waste-management-middle-east/)*
[35] (*https://www.bioenergyconsult.com/waste-management-middle-east/*)
[36] (https://www.ecomena.org/tag/plastic-recycling-in-middle-east/
[37] (http://saudigazette.com.sa/article/560793/BUSINESS/MENA-region-packaging-industry-poised-for-growth) (https://global-recycling.info/archives/522)
[38] (https://global-recycling.info/archives/516)

in the 2009 Arab Regional Strategy for Sustainable Consumption and Production. The Strategy identified goals and methods for improving the state of plastic production and consumption (among other items) in the region. However, many of the ideas laid out remain unrealized, thus giving the League ample room for implementing and reevaluating the recommendations therein.[39] It is imperative that the League begin finding various ways to productively use plastic waste, be that through energy production or innovative construction solutions that are being developed around the world if the situation is to be remediated. Considering the uncharted nature of waste management in the region, a major role for the committee to play will be in setting up a legal framework that can help facilitate the development of better waste management systems. In addition to League generated initiative, outside cooperation such as the "regional network for integrated waste management in the MENA region" developed and led by the German Federal Ministry for Economic Cooperation and Development may be able to provide valuable technical insights and expertise that can accelerate the development of a mature waste management sector.[40]

II. Questions to Consider in Your Research

- Is my country a major producer, consumer, or depository of plastic waste? How does this impact my agenda when formulating a League-wide policy?

- What previous steps has my country taken to mitigate the impact of plastic waste, and to what extent have those efforts been successful?

- What are the biggest negative externalities of plastic waste for my country – lost tourism, public unrest, ecological damage, or threat to human wellbeing?

- Is my country in a position to capitalize on the possible commodification of plastic waste via energy production, export/importation of recycling, or repurposing as construction or raw material for other goods?

- Is the requisite legal and regulatory framework in place in my country to allow for the proposed improvements, or should I be looking to the League for guidance on better practices?

III. Questions a Resolution Might Answer

- What is the League's responsibility to mitigate its contribution to the ecological impact of plastic waste? Particularly in terms of its proliferation in the world's oceans and contribution to greenhouse gas emissions.

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[39] (http://www.unep.fr/scp/marrakech/publications/pdf/Final%20Draft%20Arab%20Strategy%20on%20SCP%20-%2006-10-09.pdf)

[40] (https://www.giz.de/en/worldwide/14306.html)

- Should implementation measures be universal and transnational, or should they be focused on improve domestic efforts to reduce plastic waste?
- Are any member states susceptible to becoming dumping grounds for major waste exporters such as the United States, and what steps should be taken to protect their sovereignty in this regard?
- How does the disparate condition and structure of existing waste management systems across the League impact the implementation of any solutions devised by the committee?

IV. Additional Resources

- https://www.oecd.org/environment/waste/policy-highlights-improving-plastics-management.pdf
  OECD recommendations for better management of plastic production, distribution, disposal
- https://global-recycling.info/archives/2620
  http://www.unep.fr/scp/marrakech/publications/pdf/Final%20Draft%20Arab%20Strategy%20on%20SCP%20-%2006-10-09.pdf
  Arab Regional Strategy for Sustainable Consumption and Production – a policy document overviewing the Leagues endeavors to mitigate waste of various kinds
- https://ourworldindata.org/plastic-pollution
  Overview of the world's relationship with plastic since the dawn of the plastic era
- https://www.ecomena.org/waste-to-energy-perspectives-for-middle-east/
  Discussion of waste to energy schemes that may allow developing Arab states to commodify their waste

Topic IV: Analyzing the level of air pollution in urban areas and establishing methods to mitigate the pollution and improve air quality.

I. Introduction to the Topic

A. General Background

As the world continues on its unceasing march into the post-modern era, characterized by the industrialization and urbanization of developing countries, and the ravenous growth of consumers' appetites in developed ones, the ramifications of air pollution extend far beyond their impact on climate change. Some compounds, known as greenhouse gases, are infamous for their ability to trap infrared radiation (the spectrum of light that you feel as warmth from sunlight) from the sun in our atmosphere – thereby increasing the temperature of the air and seas as they transfer energy to the ambient environment. however, much of the air pollution that must be addressed does not even have a corollary relationship with the warming of the planet. Globally, 4.2 million people die every year as a result of exposure to a wide variety of air pollutants, 3.8 million die each year from household exposure to smoke from dirty cooking stoves and fuels, and 91% of the world's population lives in places where air quality does not meet WHO limits.[41]

An overview of the most dangerous chemicals and biological materials in the atmosphere around urban areas that threaten human and environmental health are as follows: Carbon dioxide (CO2), Sulfur dioxide (SO2), Nitrogen dioxide (NO2), Carbon Monoxide (CO), Methane (which is also the result of burning natural gas), particulate matter (PM), toxic metal particulate (lead, mercury, nickel), Chlorofluorocarbons (CFCs - banned by the Montreal Protocol in 1987), and Ammonia (from sewage and agro-waste). All of these have serious negative health consequences for humans when beyond a limited level, and all but CFC's are present and produced by anthropogenic (man-made) means in excessive quantities in urban environments throughout the region. Negative health outcomes that are known to have correlations with air pollution include increased incidence of various cancers, respiratory disease (asthma, etc.), general hospital admissions, human immune system reactions and allergic diseases, cardiac diseases and stroke, cardiovascular disease, increased prevalence and severity of multiple sclerosis, type 2 diabetes, blood hypertension, tuberculosis treatment failure (and the development of multidrug-resistant TB), as well as a strong association reported between low birth weight, spontaneous abortion, premature birth, changes in gene expression, and chromosome aberrations in newborns.[42] Unfortunately, gains in infant mortality and life expectancy obtained through the improvement in socioeconomic conditions in the region can be negated by air pollution. Sand and dust even have compounding negative

[41] (https://www.who.int/airpollution/en/)

[42](https://www.who.int/airpollution/events/conference/CAPH1_Plenary_session_III_4_AP_and_its_health_effects_in_EM_region_Narges_Khanjani.pdf)

externalities for those with asthma, cardiopulmonary/heart disease, and other complications - and these particles are ever more present as the region experiences greater desertification.[43]

More specifically, in 2018 the WHO Global Ambient Air Quality Database found that 97% of cities in low and middle-income nations with a population over 100,000 do not meet WHO air quality guidelines. Furthermore, the MENA region and Southeast Asia were the regions that performed worst according to the WHO database.[44]

B. History in the Arab World

It should be noted that the extent of air pollution varies greatly throughout the Arab League. In the GCC states, CO2 emissions are four times higher than the global average, and eight times higher than the rest of the League. The emissions become even more jolting when evaluated on a per capita basis, given the smaller population of many GCC countries. Several GCC cities even rank in the top 20 most polluted cities in the world, and Cairo is in the top 3 most noxious cities on the planet.[45] Particulate matter reaches greater than 60 times permissible levels in some cities. So, where are these air pollutants coming from exactly? – factories, power plants, fossil fuel production, and increased private motor transportation. Moreover, the emissions portfolio of each state is vastly different, with some states having >60% of their carbon footprint coming from transportation, and others spending 69% of their carbon budget on electricity and heating generation.[46]

Ongoing and rapid urbanization has contributed to the deteriorating situation in many Arab cities - from 1970 to 2010 the average urban population of Arab States increased by 300%.[47] Likewise, in the period from 1990 to 2009, the MENA region ranked 2nd only to China in the growth of CO2 emissions (with a roughly 160% increase). Though on a slightly positive note, emissions per GDP (the ratio of total carbon emissions to national GDP) went down by 33% over the same period, giving economic viability to a future solution.[48] Thus far, some factors heightening the challenge of the problem include low insight into its severity, low budgets allocated for research and mitigation, lack of capacity (and desire) to monitor and report exposure to air pollution, alongside increasing population, traffic, and industrialization.[49] The limited number of studies about air pollution in many League states hinders our ability to quantify the shear health and economic toll. Only four member states have completed more than four studies on national air quality to date.

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[43] (https://en.wikipedia.org/wiki/Air_pollution)
[44] https://www.atlanticcouncil.org/blogs/menasource/poor-air-quality-and-lost-economic-opportunities
[45] (https://blog.theecoexperts.co.uk/most-polluted-cities)
[46] (http://www.arabnews.com/node/1374621)
[47] https://www.unescwa.org/publications/social-development-bulletin-urbanization-sustainable-development-arab-region)
[48] (https://www.unece.org/fileadmin/DAM/trans/doc/themes/ForFITS/ESCWA%20-%20Overview%20of%20CO2%20emissions%20in%20the%20Arab%20Region.pdf)
[49] http://www.carboun.com/energy/road-to-doha-sustainable-transportation-in-the-middle-east/)

At a regional scale, the World Bank estimated that excessive air pollution costs the Arab League $9 billion outright in lost labor and up to $154 billion annually in welfare losses from premature deaths, government mitigation, human suffering, and health costs (equivalent to about 2.2% of regional GDP), with some countries losing up to 3.6% GDP.[50] Poverty throughout the region also compounds these factors through both the prevalence of older and poorly maintained motor vehicles and factories, as well as limited access to vital air filtration systems in people's homes and places of employment.

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

To date, one area of major headway in the region has been the reduction of Sulfur dioxide (from 1000 parts per million PPM to 50 PPM) and airborne lead particulate through the strict tightening of regulation on diesel and an outright ban on leaded gasoline respectively. However, there is still plenty of room for improvement in areas outside the transportation sector, and in improving the sector's efficacy in numerous other regards (fuel standards, engine maintenance, and increased prevalence of private motor vehicles as the socioeconomic situation throughout the region improves).[51] In 2016, the World Health Organization released a report with wide-ranging recommendations for how to tackle air pollution around the world, providing an exemplar springboard for future Arab League initiatives to combat the health and environmental epidemic of air pollution in the region.[52]Although the committee must evaluate the specific and varied situations endemic to the Arab League and Arab cities (as well as the heterogeneous severity of air pollution among members), it is a good exercise to study effective anti-pollution measures that have succeeded around the world. One such example, Spain's Madrid Central plan, launched in January 2019 reduced the presence of toxic pollutants in the city by between 20-30%.[53] Even if its ban on non-zero emissions vehicles (anything but electric and hybrid cars) in central Madrid may be impossible to replicate in the Arab League – due to economic and regulatory limitations – it is worth examining; inspiration is the key to innovation.

II. Questions to Consider in Your Research

- What are the largest sources of air pollution endemic to my country, and to what extent can these be curtailed without having a negative impact on the economy?

- How has my country handled the explosion of urban dwellers? Are the existing systems acclimated to the larger population, or are they stressed to a point of dysfunction?

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[50] (https://openknowledge.worldbank.org/handle/10986/25013)
[51] (https://www.ecomena.org/air-quality-arab/)
[52] (https://www.who.int/phe/delivering-air-quality.pdf?ua=1)
[53] (https://endesavehiculoelectrico.com/en/espanol-todo-sobre-el-area-de-acceso-restringido-madrid-central/)

- What aspects of the 2016 WHO guidelines and recommendation have been implemented in my country (if any), and which improvements are most tangible for my political and economic situation?

- How can the public be better informed about the health risks of air pollution so that they can attempt to mitigate its effects on their personal health?

III. Questions a Resolution Might Answer

- What kinds of air pollution pose the greatest threat to the Arab League in terms of economic, health, and environmental costs? and how can they best be mitigated

- Is the solution to the problem better found in upgrading/replacing existing systems to produce less pollution, or through regulation to limit the output of harmful air pollutants?

- What improvements to urban environments can be made to make them more resilient to the damaging effects of air pollution?

- What kind of responsibility, if any, should the League take for its outsized per capita contribution to global emissions?

IV. Additional Resources

- https://www.atlanticcouncil.org/blogs/menasource/poor-air-quality-and-lost-economic-opportunities
  Excellent article that puts a lot of information into context in a short amount of space
- (https://en.wikipedia.org/wiki/Air_pollution)
  Although it is Wikipedia the article does provide a thorough explanation of the different kinds of air pollutants, their sources, dangers, and prevalence – all important information for this topic – in a navigable and digestible manner
- http://www.afedonline.org/webreport2017/FINAL/1-20%20introduction.pdf
  comprehensive report on the projected future quality of the regional environment – it's only 20 pages long, and section 7 on air pollution is just over a page
- https://www.worldatlas.com/articles/cities-with-the-worst-air-quality-in-the-middle-east.html
  good article to see how your country fairs in terms of air pollution vis-à-vis the rest of the region
- https://wedocs.unep.org/bitstream/handle/20.500.11822/20255/NorthAfricaMiddleEast_report.pdf?sequence=1&amp%3BisAllowed=
  A comprehensive overview of most prior actions taken by the League to improve air quality in the region.