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The Importance of Regional Cooperation for Climate Change Adaptation and Building Resilience

Sustainability Research Paper

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The global community stands at a pivotal juncture in its fight against climate change. As the impacts of climate change become increasingly evident, the need for collective action and regional cooperation in addressing its impacts gains prominence. Climate change's impacts cut across all sectors and levels of governance, underscoring the necessity for regional cooperation through multi-stakeholder partnerships. How will climate change affect the MENA (Middle East and North Africa) region in the coming decades? To what extent do MENA countries collaborate regionally to combat climate change? What are some key adaptation strategies to shield populations and economies from the impacts of global warming?

SUSTAINABILITY RESEARCH PAPER

This research paper is part of a 12-month series published by the Al-Attiyah Foundation every year. Each in-depth research paper focuses on a current sustainability topic that is of interest to the Foundation's members and partners. The 12 technical papers are distributed to members, partners, and universities, as well as made available on the Foundation's website.

03 EXECUTIVE SUMMARY

- The MENA region faces growing impacts of climate change ranging from slow onset events like aridification and sea level rise to sudden extreme events such as floods and heatwaves.
- The region's climate change impact vulnerability is exacerbated by socio economic factor like population growth and urbanisation.
- Adaptation strategies are essential to protect populations, economies, and ecosystems against the adverse effects of climate change.
- Climate change impacts cut across all sectors and governance levels, emphasising the need for regional cooperation through multi-stakeholder partnerships. Such cooperation should aim at sharing economic and human resources and skills and can build on experience gained in the past.
- The interconnectedness of the MENA countries, geographically, economically, and culturally provides an opportunity for collaborative efforts, pooling of resources, and shared development of technologies.

The impacts of climate change are escalating with varying intensity across the different regions of the world and the most vulnerable communities are observed to be the most affected. Notably, the Middle East and North Africa (MENA) region is particularly vulnerable and therefore, expected to be strongly affected by climate change impacts. While traditionally characterised by arid and semi-arid climates, with limited water availability generally due to low precipitation and relatively high temperatures, the region is witnessing a surge in various climate change related hazards. Reduced rainfall in combination with increased temperature will drive aridification, which given its limited groundwater reserves is already now one of the most water-stressed areas in the world. Additionally, other climate hazards like sea level rise, heatwaves and flooding are threatening water as well as food security, and putting at risk health, livelihoods, infrastructures, and biodiversity.

This situation is exacerbated by key socio-economic trends like e.g., population growth and the acceleration of urbanisation, deteriorating the living conditions for many city residents. These changes are causing severe economic disruptions, endangering food security, and jeopardising public health. Consequently, social disparities are widening, leading to increased migration, poverty, and conflict to access resources.

Additionally, the MENA region presents very heterogeneous social and economic contexts, with for instance per capita income level varying significantly. These disparities are reflected in very different institutional, socio and economic conditions in the region. Eighty-five percent of the total MENA population and 95% of rural MENA population is located in Low and Middle Income (LMI) countries.

Despite the evident and growing climate change impacts which are becoming increasingly complex and difficult to manage, collaborative efforts within the MENA region to address these challenges remain limited. This paper explores how cooperative and multi-stakeholder partnerships can be part of the strategy for tackling climate impacts through building resilience in the region. Particular attention is paid to slow onset events, which are characterised by their gradual yet persistent changes over extended periods, often spanning decades.

These changes, while subtle initially, compound over time, leading to significant deterioration in environmental and living conditions. In the MENA region, prominent slow onset events include increase in temperature and changes in rainfall leading to aridification, i.e., a chronic reduction in soil moisture caused by an increase of mean annual temperature or a decrease in yearly precipitation. Similarly, the slow but relentless rise of sea levels risks displacing coastal communities and contaminating freshwater resources is a slow onset hazard significantly affecting the region. Compared to sudden extreme events, slow onset events have received in the past significantly less attention, probably because their effects are less visible. The paper focuses on the particular benefits of regional cooperation for slow onset events.

Slow onset events like aridification and sea level rise and sudden extreme events like heatwaves and flooding are different climate hazards by nature and require specific approaches. The following sections describe the specificities of each hazard.

Aridification

The MENA region, encompassing diverse climate conditions from the Arabian Peninsula's deserts to the highlands of Turkey and Iran, is predominantly characterised by drylands, covering approximately 89% or 14.1 million km2 of its area. These drylands experience irregular rainfall and exhibit unique soil conditions leading to pronounced land degradation challenges. Thus, they are particularly vulnerable to climate change. A 2°C rise in temperature could lead to a reduction in rainfall by about 10-20%, and a 4°C scenario up to a 50% decrease. This reduction in precipitation notably affects water resources, impacting both agriculture and livestock significantly. Alongside the warming temperatures, diminished rainfall is likely to shift the 'aridity line,' the juncture where fertile lands transition into desert areas, defined by an annual precipitation below 200mm, making rain-fed agriculture unfeasible. Applying UNEP's Aridity Index (AI) which quantifies moisture deficiency, determined by the relationship between rainfall and potential evapotranspiration, about 60% of MENA's land is considered hyperarid. Looking at a period of 71-years, Sahour et al. (2020) find a shift towards increased aridity in most Middle Eastern countries including Turkey, Iran, and Saudi Arabia, with some areas experiencing up to a 96% decrease in their AI values. Increased aridity often was found in areas experiencing negative precipitation trends.

While aridification focuses on the soil water content, desertification refers to a more general degradation of land quality. According to the UNCCD, desertification is defined as "the degradation of land in arid, semi-arid, and dry sub-humid areas. It is not the natural expansion of existing deserts but a gradual process of soil productivity loss and the thinning out of the vegetative cover due to human activities and climatic variations such as prolonged droughts and floods". Desertification is rampant in the MENA region: 6% of the region's land is slightly desertified, 21% moderately, 31% severely, and 11% very severely. This degradation manifests itself in various ways, including increased soil erosion, land salinisation, dust storms, and the proliferation of active sand dunes. As a result, around 45% of the total agricultural area faces threats like salinisation, soil nutrient depletion, and wind-water erosion. This includes 68% of rainfed agricultural land, 33% of irrigated cropland, and a staggering 85% of rangeland. The repercussions of aridification and land degradation in the MENA region extend beyond environmental concerns. For instance, the region's food production is heavily reliant on land and water, both of which are scarce. Without adaptation of farming practices, climate change impacts could jeopardise the domestic resource base for food production. This could pose significant food security risks, especially for lower and middle-income countries. Reduction of water availability for food production and growing population may increase dependency on food imports, making the whole region more vulnerable to global food prices and other crises (as it is the case for cereal imports due to the war in Ukraine) and may reinforce migrations within and from low-income countries in the area.

These slow onset events will be exacerbated by more frequent and intense extreme events like droughts (IPCC 2018). Increased occurrences of drought can trigger sandstorms due to soil dryness and lead to accumulation of desert dust in the atmosphere. Such events can fast-track land degradation and desertification, impede solar energy production, and cause erosion and sedimentation that obstruct both water and land transportation systems.

These climate change related challenges, combined with the region's socio-economic vulnerabilities, underscore the need for tailored information and resilience-building measures. Addressing knowledge gaps and fostering adaptation action is crucial for the region's future.

The EU identified for instance the following needs for tackling desertification and achieving the land degradation neutrality target defined by the UNCCD: i) better understanding land degradation and desertification (identifying methodologies for assessing desertification, start collecting data), ii) assessing the needs to improve the legal frameworks on soil protection and iii) defining a strategy for achieving land degradation neutrality targets.

Actions for tackling aridification could include the setup of Monitoring Reporting and Verification (MRV) systems for assessing the quality of land, evaluation of potential existing policy gaps to be addressed and identification of financial sources for supporting land restoration, conservation, and management.

Sea Level Rise

Global warming results in the melting of polar ice caps and glaciers. This, coupled with the expansion of seawater as it warms, leads to rising sea levels. In the context of the MENA region, approximately 7% of the total population is located in low lying coastal areas (less than 5 metres altitude) and large parts of economic activities, major urban centres, agriculture and population are located in coastal areas exposed to flooding, land erosion and salinisation, leading to property and asset loss. Already, several coastal cities are increasingly vulnerable to flooding.

Sea level rise can exacerbate existing vulnerabilities, primarily tied to urban infrastructure and planning. For instance, inadequate urban stormwater infrastructure, clogging of sewers by sandstorms, and backwater effects on drainage systems in coastal cities like Casablanca and Doha amplify the impacts of sea level rise. The potential displacement of populations from coastal areas can exert socio-political pressures, further destabilising the region. Given the high socio-political instability in parts of MENA, displacement due to sea level rise might act as a catalyst for violent conflict, economic hardships, and food scarcity.

Bongarts Lebbe et al. (2021) found that for tackling sea level rise, i) there is need of hybrid governance approaches (ranging from infrastructure based to integrated approaches and from protection adaptation measures) and integrating stakeholders in the design and implementation process, ii) that dynamic and participatory policies can foster collective learning processes and iii) that adaptation policies should rely on knowledge and participatory engagement, multi-scalar governance, policy monitoring, and territorial solidarity.

Heatwaves

The MENA region is known for its historical resilience to high temperatures. However, the region is now experiencing an unprecedented intensification in the frequency, duration, and severity of heatwaves. When global temperatures rise by an average of 2°C compared to pre-industrial times, it is anticipated that around a third of the summer months in most of the MENA area will experience unusual heat waves. If temperatures increase by 4°C, the MENA region might regularly see temperatures as high as 56°C. By the century's end, some areas within this region could see summer temperatures that are 8°C hotter. Then, a staggering 80% of the most populous cities within MENA would experience heatwave conditions for at least half of the days during their warm season.

The repercussions of such intensified heatwaves extend beyond just thermal discomfort. For instance, Lebanon and the coastal highland regions of neighbouring Syria have already faced severe challenges. Summer heatwaves in these areas have catalysed hundreds of fires, some of which have encroached upon residential zones, necessitating large-scale evacuations.

Heatwaves lead to a spike in mental and physical stress, morbidity, and most worryingly, increased mortality rates, especially among vulnerable demographics like the elderly. Even in a 2°C global warming scenario, the mortality risk associated to heat stress for people aged over 65 is estimated to increase in MENA by three to seven times by 2100. In that context, heatwaves can trigger a "domino effect", starting with compromised water security, leading to reduced agricultural productivity, and culminating in forced migration, displacement, and urbanisation.

C40 identifies the following actions for tackling heatwaves that can be relevant for the MENA region: understanding the heat risk by measuring temperature and mapping vulnerabilities (particularly identifying the most vulnerable groups); developing a heatwave response plan (e.g., utilising existing temperature forecasts, establishing partnerships between different stakeholders, enhancing the capacities of healthcare professionals, etc.); and formulating long-term action plans (e.g., implementing urban greening, employing alternative shading and cooling methods).

Flooding

Flash floods, especially those that follow dry riverbeds, have a range of influencing factors. Their intensity can be linked to the basin's geological and morphological features, such as rock type, slope, elevation, and size. Changes made to the landscape by human activities can influence the occurrence and behaviour of flash floods (Shah et al. 2023; Ezzeldin et al. 2023).

The MENA region has witnessed an increase in flash flood events, which is in line with an increase in climate variability as climate change progresses. Cities including Alexandria, Cairo, Casablanca, Derna, Doha, Guelmim, Jeddah, Kuwait, Muscat, and Riyadh have been confronted with unexpected flash floods in recent years, many of which caused significant human, economic, and infrastructural losses.

In the past 40 years, floods have accounted for a staggering two-thirds of human casualties and approximately one-third of the economic damages from natural disasters in the MENA region.

This surge in flooding events, which is exemplified by the recent tragedy in Derna in Libya where up to 10,000 people may have been killed, can be attributed to a multitude of factors. Foremost among these is extreme precipitation, exacerbated by factors such as inadequate infrastructure, and haphazard urbanisation due to poor city planning. In regions that typically experience dry conditions, residents may not be fully aware of the risks associated with flash floods. Consequently, flood-prone areas are often developed for housing and infrastructure. To ensure the resilience and sustainability of urban areas, urban planning needs to consider flood mitigation strategies. For instance, to mitigate flood challenges in Jeddah, Saudi Arabia land-use needs to be optimised and flood data capture systems modernized. Prioritising advancements in flood hydrology and strengthening urban flooding countermeasures are crucial.

A combination of educational initiatives, regulatory enforcement, and targeted hydrological research can further bolster flood resilience.

Floods, while posing risks, also present opportunities by providing water that can be stored to be used over long periods. In arid and semi-arid nations, where there is an urgent need for solutions to water scarcity, managing floods is integral to overall water management.

Why Is Regional Cooperation Meaningful?

The challenges posed by climate change are complex, multifaceted, and pervasive. Climate change impacts are anticipated across all sectors and scales of governance, from the local communities to the global level.Yet, amidst these challenges lies the opportunity for strengthening regional cooperation in order to adapt and build resilience to climate change.

The 2015 Paris Agreement on Climate Change underscored the significance of adaptation, marking a shift from the historical emphasis on mitigation. In order to achieve effective adaptation, regional cooperation becomes paramount. Actions taken by one country in a shared ecosystem can directly impact neighbouring nations, emphasising the importance of a coordinated, regional approach to adaptation, especially to overcome traditional organisational boundaries. This collaborative approach is not just about pooling resources but also about leveraging the diverse strengths, knowledge, and values of different actors to achieve outcomes that single stakeholders could not achieve alone.

Climate change adaptation is an inherently multi-level challenge. While key impacts, such as sea-level rise or extreme weather events, manifest globally, their specific consequences vary considerably at regional and local levels. This variation underscores the importance of region-specific adaptive strategies. Furthermore, regions or provinces have the unique advantage of being strategically positioned to link diverse policy areas while also being close enough to local levels to develop tailored solutions. Such regional interventions can include initiatives like building green infrastructure, regulating land use, resilient water and urban ecosystem services, and others.

Regional cooperation can become an integrated instrument to address shared challenges and pursuing mutual interests across nation-states. It can provide a platform for diverse actors to join hands and maximise their collective potential. We illustrate the significance of regional cooperation through the lens of three case studies:

Case Study 1: The Islamic Development (IsDB) – Mobilising Access to Finance in the Region

Founded in 1974 and located in Jeddah, Kingdom of Saudi Arabia, the Islamic Development Bank (IsDB) has progressively positioned itself as a focal institution for regional cooperation and integration (RCI) among its 57 member countries, situated in highly vulnerable regions of the world.

The Regional Cooperation and Integration Strategy

The IsDB Regional Cooperation and Integration (RCI) strategy entails collaboration of its diverse member countries to strengthen their economies, share risks, manage common resources, and avoid conflicts. The RCI facilitates the efficient movement of goods, services, and information, thus creating integrated economic zones that are conducive to foreign investments and broader market access. The IsDB stresses that efficient financial markets and greater capital mobility cannot be achieved solely by individual economies, highlighting the pivotal role of regional cooperation. The bank supports both "hard" infrastructure projects, like the Bereket-Etrek Railway in Central Asia, and "soft" initiatives such as streamlined border procedures, reinforcing regional integration and connectivity. The IsDB also promotes pooling and sharing of knowledge, technological advances, and institutional capabilities for mutual benefits within members across regions. The RCI is financed through different **flagship programs like the Investment Promotion Technical Assistance Program (ITAP) and the Technical Assistance Program (TAP),** as well as through Foreign Direct Investment (FDI), **Foreign Portfolio Investment (FPI), and domestic resources.**

IsDB's Contribution to Adaptation

For many IsDB member countries, particularly those with economies heavily reliant on agriculture, fisheries, or other climate-sensitive sectors, adaptation is not just a strategy—it is a necessity.

The IsDB has been proactive in addressing global food insecurity, especially in the backdrop of disruptions caused by the COVID-19 pandemic and the Eastern Europe conflict, with the endorsement in July 2022 of a USD 10.54 billion comprehensive Food Security Response Program (FSRP). Additionally, in 2022, the IsDB allocated USD 1.05 billion to climate finance, representing one third of the total approved investments by the Bank for that year. 65% (approx. USD 682.5 million) of this amount was directed towards climate adaptation-related activities.

Last year, the bank announced its aim to support the implementation of its member countries' Nationally Determined Contributions (NDCs), focusing on long-term climate strategies enabling economies to be more resilient to climate impacts. Last year, IsDB committed USD13 billion in climate financing by 2030. Finally, it approved recently various emergency response grant projects for countries such as Afghanistan, Pakistan, Chad, and Sudan, which have been affected by recurrent floods and droughts due to climate change.

Through its regional Cooperation and Integration (RCI) strategy and its commitment to financing adaptation the bank offers an example of successful financial cooperation in the region for tackling climate hazards, but also illustrates the need for countries in the region to develop joint approaches, not only for investment but also for sharing knowledge, and building capacities.

Case Study 2: The West African Climate Alliance on Carbon Markets and Climate Finance

The West African Alliance on Carbon Markets and Climate Finance was founded in 2017. Its main aim is to facilitate the involvement of West African countries in carbon markets and to increase their access to climate finance under the Paris Agreement. Presently, 16 West African nations are part of this Alliance.

Carbon markets play a crucial role in driving finance to the West African sub-region. They are pivotal for introducing significant changes in sectors such as energy, industry, transportation, waste, and agriculture. These changes are necessary for reducing emissions in line with the Paris Agreement. Additionally, they aim to preserve nature and biodiversity in the region and improve living standards.

The Alliance supports a harmonised approach across the sub-region, applying consistent regulatory frameworks for carbon markets, standardised infrastructure, methodologies, legal processes around carbon credits, and strategies to reduce investment risks.

Since the Alliance's inception, it has played a proactive role in enhancing the involvement of West African countries in UNFCCC negotiations, especially around Article 6. In conjunction, the Alliance has also hosted events to deepen knowledge and prepare countries for carbon markets under Article 6. From 2020 onwards, the Alliance's emphasis has been on building the capacity and support structures of West African countries, to ensure their continuous engagement with carbon markets and climate finance under the Paris Agreement.

Notable Initiatives

Voluntary cooperation, especially under Article 6 of the Paris Agreement, as well as voluntary carbon markets, are seen as means to boost

both adaptation and mitigation actions. This directly supports the nationally determined contributions (NDCs). Stakeholders in the region collaborate and strengthen West African involvement in carbon markets to meet regional climate goals and sustainable development objectives.

In June 2022, the Alliance published the "Article 6 Readiness Blueprint", a guide that presents the Article 6 rules and regulations for government representatives and project developers in the region. The Blueprint provides clear information that can assist Article 6 focal points. Alongside this, the Alliance has organised workshops to promote discussion and shared learning among member countries. An updated version of this Blueprint, incorporating insights from these workshops and outcomes of COP27, is set to be released in 2023.

The Alliance's efforts include:

- **Capacity building:** The Alliance has been instrumental in training officials, professionals, and stakeholders in West African countries on carbon markets and climate finance. These training programs have not only improved understanding but have also facilitated better implementation of carbon-reducing projects.
- **Enhancing the voice of the region in the UNFCCC negotiation:** The Alliance has provided a platform for West African nations to voice their concerns, needs, and contributions in global negotiations, especially in UNFCCC negotiations surrounding Article 6.
- **Knowledge dissemination:** Through its website and workshops, the Alliance consistently shares information, best practices, and research findings.
- **Building partnerships:** The Alliance has successfully built partnerships with international entities, aiming that West African interests are represented, and that the region benefits from global initiatives. These partnerships span public and private sectors, helping to bring in both expertise and investments.

The West African Alliance on Carbon Markets and Climate Finance illustrates the merits of regional cooperation in addressing the intricacies of carbon markets and climate finance. By acting as a collaborative platform, the Alliance facilitates the region's interactions with wider global climate frameworks. Such regional collaboration potentially optimises resource utilisation and knowledge sharing, emphasising the importance of a united approach in complex endeavours.

Case Study 3: The Sahara and Sahel Observatory (OSS)

Founded in 1992, the Sahara and Sahel Observatory (OSS) is an international organization headquartered in Tunis since 2000. As of 2023, OSS has 33 member States (26 of which from Africa) as well as 13-member organisations.

OSS's overarching mission is to bolster its African member nations in sustainably managing their natural resources amidst a challenging climate change backdrop. The organisation's sphere of influence mainly encompasses arid, semi-arid, and dry sub-humid zones of Africa. With an extensive mandate, OSS is engaged in i) Implementing multilateral agreements on desertification, biodiversity, and climate change, ii) Promoting regional and international initiatives pertinent to Africa's environmental challenges and iii) Aligning concepts, approaches, and methodologies related to Sustainable Land and Water Management (SLWM) and climate change. Through its "Land," "Water," "Climate," and "Biodiversity" programs, aiming for a cohesive and coordinated approach to natural resource management across Africa, OSS addresses land degradation and desertification, sustainable water resource management, the enhancement of resilience among local populations and the conservation of the rich biological heritage of the continent.

OSS's accreditations to the Green Climate Fund (GCF) (one GCF funded project) and the Adaptation Fund (AF) (7 AF funded projects), makes it a pivotal entity for assisting member countries accessing climate finance.

OSS is also a key player for enhancing knowledge transfer, capacity building and awareness raising among stakeholders with for instance the organisation of regular regional workshops on diverse topics (Early Warning Systems, remote sending, natural capital accounting, etc.).

Additionally, OSS's seminal contribution to studies, notably those that resulted in tools assessing efforts against desertification, is noteworthy. Its long-standing involvement, since 1993, in the ROSELT network for Long-Term Ecological Monitoring exemplifies its dedication to understanding land degradation, human activities, and climate change nuances.

Finally, recognising the extensive vulnerabilities of its member nations, OSS has been involved in different adaptation and resilience building activities. It spearheaded projects like ILWAC and REPSAHEL, focusing on bolstering resilience to climate change and addressing environmental changes. It also collaborated on international platforms, such as its Memorandum of Understanding with the IPCC Technical Support Unit, to disseminate pivotal climate change insights and on projects like MECCA and ACCA to monitor and evaluate climate change adaptation strategies.

For fostering climate resilience, OSS has effectively mobilised resources from different sources including voluntary contributions from its member countries, earmarked funds for designated initiatives and allocations from national or multinational entities. This varied funding base helps providing stability and enabling the OSS to plan and implement adaptation strategies effectively.

By synergising regional efforts, developing strategic partnerships, and pioneering innovative projects, OSS plays a pivotal role in shaping a resilient and sustainable African continent. Its multifaceted approach, combining research, capacity-building, and on-ground interventions, showcases the potential of integrated strategies for tackling complex challenges like the climate crisis.

Those three case studies illustrate the relevance of regional cooperation for strengthening adaptation and building resilience through:

- **Accessing finance:** regional alliances often allow for pooling of resources which leads to more significant, impactful projects. Member countries can come up with cost-efficient solutions and get access to broader funding platforms, as seen with the IsDB. This also enables avoiding duplication, achieving economies of scale and cost sharing, and possibly leading to the joint implementation of adaptation activities.
- **Knowledge and technology transfer:** Regional cooperations also plays a relevant role for sharing expertise and technological innovations, as seen with the OSS and the West African Alliance on Carbon Markets and Climate Finance.
- **Policy/Strategies harmonisation:** such cooperations enable countries to come up with consistent frameworks and policies, enhancing regional stability and alignment in goals, such as efforts against desertification by OSS.
- **Enhanced negotiating power:** Regional alliances often yield a louder voice in global forums, as seen with blocs during the Conference of the Parties (COP) negotiations. They can push for agendas and interests more effectively than nations acting individually.

15 POTENTIAL BENEFITS OF A REGIONAL COOPERATION ON ARIDIFICATION IN THE MENA REGION

As described initially, slow onset events in the past received significantly less attention than sudden extreme events, probably because their effects are less visible. However, addressing slow onset events is a key pillar for building resilience of social and natural systems. Water scarcity and food security being two of the most pressing challenges for the MENA region, addressing aridification of land in the region is of utmost importance.

At a political level, there is clear awareness of the need to tackle the food, water, and climate nexus. At MENA Climate Week earlier this month, the League of Arab States represented by Ambassador Shahira Wahbi presented key strategies and plans on Climate Change, Water Security, as well as Food and Land.

Developing a more targeted regional cooperation on aridification in the MENA region holds immense promise. By pooling resources, sharing knowledge, and fostering unified strategies, the region cannot only address the immediate challenges but also pave the way for sustainable development and prosperity.

The Drought Initiative led by UNCCD, and launched last year at COP27, can serve as a model and resource for tackling aridification in the region. It focuses on drought events occurring when an area experiences a shortage of water supply due to a lack of rainfall or lack of surface or ground water. The initiative supports 70 countries developing drought smart strategies and drought risk management frameworks, under the premise that the impact of a drought not only depends on the severity of the event but also on the capacity of actors to anticipate and prepare for it. It identifies the following needs for tackling droughts that could be relevant for aridification: setting up preparedness systems, implementing joint regional efforts for tackling vulnerability and risks, knowledge sharing with the preparation of a toolbox on monitoring and early warning, vulnerability and risk assessment and risk mitigation measures.

As for other climate hazards, better understanding the risk associated to aridification across the region is a first necessary step before strengthening capacities and reinforcing the policy framework. The development of multi-country projects can be fostered by the development of such a cooperation, e.g., on joint watershed management, soil protection from erosion by afforestation, collaborative soil conservation initiatives, joint research centres (to assess soil water content, aquifer levels and innovating farming techniques adapted to the regional landscapes).

This paper delved into the critical climate change related challenges affecting the MENA region, emphasising the pivotal role of regional cooperation for tackling intensifying climate impacts through robust partnerships instead of in an isolated manner.

Partnerships for regional cooperation are not merely about pooling resources. They are about leveraging the collective strengths, knowledge, and values of different stakeholders. Such collaborations offer a platform for knowledge exchange, research, advocacy, and resource-sharing. They bring together diverse stakeholders, spanning public, private, and civil society, to address multifaceted problems that often transcend traditional organisational boundaries. In essence, partnerships amplify the impact of individual efforts, achieving outcomes that single stakeholders could not achieve alone.

Regional cooperation can particularly be relevant for addressing slow onset events like aridification or sea level rise that have generated limited attention on the international scene, as well as in the policy space and in the media.

Embracing partnerships and fostering regional cooperation will be key for facilitating and accelerating the process of enhancing adaptation and building resilience of vulnerable communities and ecosystems which are most at risk. The choices made now, rooted in collaboration and forward-looking strategies, will determine the region's future resilience and prosperity. A strong MENA region response, characterised by robust partnerships and multi-stakeholder collaborations, will not only shape its future but also serve as a beacon for other regions confronting similar challenges.

17 APPENDIX

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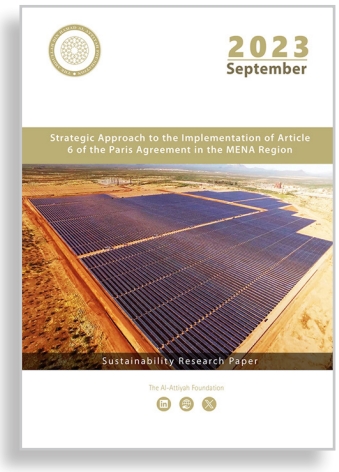

September – 2023

Strategic Approach to the Implementation of Article 6 of the paris Agreement in the MENA Region

Since the adoption of the 'rulebook' for international carbon markets and non-market approaches under Article 6 in 2021, many countries have moved towards the implementation and operationalisation of international market-based cooperation.

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August – 2023

Compliance and Voluntary Carbon Markets – What Are the Fault Lines?

A carbon credit is a tradable unit that represents one metric tonne of real, additional, and permanent greenhouse gas emission reductions or removals issued by a carbon crediting programme and recorded in a carbon registry.

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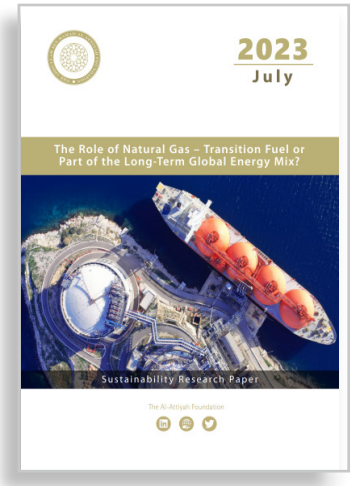

July – 2023

The Role of Natural Gas – Transition Fuel or Part of the Long-Term Global Energy Mix?

Natural gas has seen a rapid expansion since the 1970s as it has many attractive characteristics, including a low direct greenhouse gas emissions intensity. Many analysts have therefore seen it as a key "bridge fuel" to cushion the energy transition from coal and oil to renewables over the next decades.

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