Key challenges for security: conflict and cooperation in the Mediterranean

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Chapter 4
Key challenges for security: conflict and cooperation in the Mediterranean

Executive summary

Environmental change[53] contributes to intra-state conflict risk in specific contexts including poverty, institutions, and poor state capacity.

Environmental changes could increase inter-state conflicts or cooperation, depending on the ability and resources of the existing institutional frameworks to accommodate these changes.

The compound effects of conflict and climate hazards may lead to a vicious circle of temporally- and spatially-dependent risks that amplify the vulnerability of exposed societies and further increase the likelihood of conflict.

Climate adaptation initiatives may foster cooperation if carefully planned but may also increase the risk of conflict if poorly designed.

[53] The term 'environmental change', if not explicitly stated otherwise, is used to refer to changes in terrestrial and marine ecosystems as well as changes in climate conditions at local, regional or global scales.

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4.1 Geopolitics, security risks, and conflicts in the Mediterranean region

This chapter reviews existing empirical studies focusing on the relationship between environmental change (including changes in climatic conditions) and conflict in the Mediterranean, with linkages to migration and geopolitics. Conflict is broadly defined as collective actions of varying levels of intensity driven by diverging political interests, from low-intensity or social conflict, such as protest and non-lethal riot events, to civil conflict and war, to inter-state war. In line with the existing literature on climate and conflict, climate is here understood as encompassing three categories of phenomena: (1) climate change, defined as gradual changes in average weather conditions occurring over multiple decades and centuries (IPCC 2023); (2) climate variability, that refers to short-term changes in weather patterns, such as variations in temperature and precipitation; (3) extreme weather and climate events whose frequency and intensity are affected by climate change, such as droughts, floods, and storms (see *Chapter 2* for more details).

The Mediterranean region, including Southern Europe, and parts of the Middle East and North Africa (MENA), has from ancient times been a hotspot of geopolitical conflict at the intersection of three continents: Africa, Asia, and Europe. The Mediterranean Sea connected and separated the spheres of influence of major powers and their power projections, as witnessed during both World Wars, the Cold War, and in the Israel-Hamas war and crisis in Gaza. In the 21st century, geopolitical landscapes and transformation processes have become increasingly complex, linking multiple scales, actors, and dimensions of extended securitisation (Ehteshami et al. 2017).

The Middle East as part of the MENA region[54] remains at the centre of some of the world's most intractable conflicts and security dilemmas and lacks effective regional security structures (Sørli et al. 2005). A quantitative study based on the Uppsala Conflict Data Program (UCDP) finds 347 'conflict years' in the Middle East from 1946 to 2018 (Deitch and Valensi 2020). Many of these conflicts show a high level of intensity and international involvement, complicating peaceful conflict resolution. From 2012, there has been a major increase of fatalities in the MENA region, mostly driven by the Syrian civil war (Dupuy et al. 2017) *(Figure 4.1).* These estimates are likely to grow due to the conflict between Israel and Palestine, which has caused 4470 battle-related deaths as of December 2023 (UCDP candidate event dataset v23.1: Hegre et al. 2020).

There are numerous entangled conflicts between state and non-state actors. They are rooted in colonial legacies, and their main causes are ethnic, ideological, and religious tensions, regional and global power competition, and the fragility of countries with low levels of democracy (Sørli et al. 2005). Prominent cases are the Israeli-Palestinian conflict; the Iran-Iraq War; the First (1991) and Second (2003) Gulf Wars; the violent civil wars in Syria, Libya, and Yemen; and the struggle between Saudi Arabia and Iran (Deitch and Valensi 2020). In Southern Europe, the Balkan civil wars of the 1990s and tensions between Greece and Türkiye should be noted. Violent acts by non-state actors have included terrorist attacks by Al-Qaeda and the Islamic State, among others, with consequences beyond the Mediterranean region. Other consequences of conflicts spilling over to neighbouring regions in Europe, the Sahel, and Western, Central, and Southern Asia include migration and involuntary displacement, economic and political destabilisation, and trade in goods and arms (Ehteshami et al. 2017).

Of particular importance were the popular uprisings of the Arab Spring in 2011. What started as a democratic movement triggered a cascade of conflict events in the following years that 'deepened regional instability, fanned existing conflicts, and sparked new turmoil' (Deitch and Valensi 2020), leading to the fall of political regimes in Tunisia, Egypt, Libya, and Yemen, and to a prolonged civil war in Syria. Other countries that did not directly experience turmoil (Bahrain, Iraq, Jordan, Lebanon) are facing ongoing instability and intractable conflict, making the MENA

[54] Although this Analysis focuses primarily on the Mediterranean region, it also draws on data from the Mediterranean Basin, the Eastern Mediterranean and Middle East (EMME), and the broader Middle East and North Africa (MENA) region (also referred to as Southern and Eastern Mediterranean Countries). In this Analysis, the MENA region refers specifically to countries bordering or closely connected to the Mediterranean Sea.

region a fragile, chaotic, and violent arena, sensitive to multiple security risks.

In addition to hard security threats involving violence, militarisation, and arms races, the Mediterranean region is experiencing 'soft security' risks associated with energy and climate change, environmental degradation and resource scarcity, population growth and migration, health, and development. Climate change has been described as a risk multiplier interwoven with the region's geopolitical dimensions (Scheffran 2021). Global warming poses additional stress on vital sectors (agriculture, forestry, fisheries, tourism, health, and electricity generation), especially in Mediterranean countries with high vulnerabilities and low adaptive capacities, diminishing agricultural production, income, and food security. The shrinking resource base undermines human livelihoods and development opportunities for a growing population, and contributes to unemployment, poverty, economic recession, weak governance, and political instability, which are potential drivers of violence and conflict (Scheffran 2021). In the following, potential pathways between climate change and violent conflict are discussed based on empirical literature.

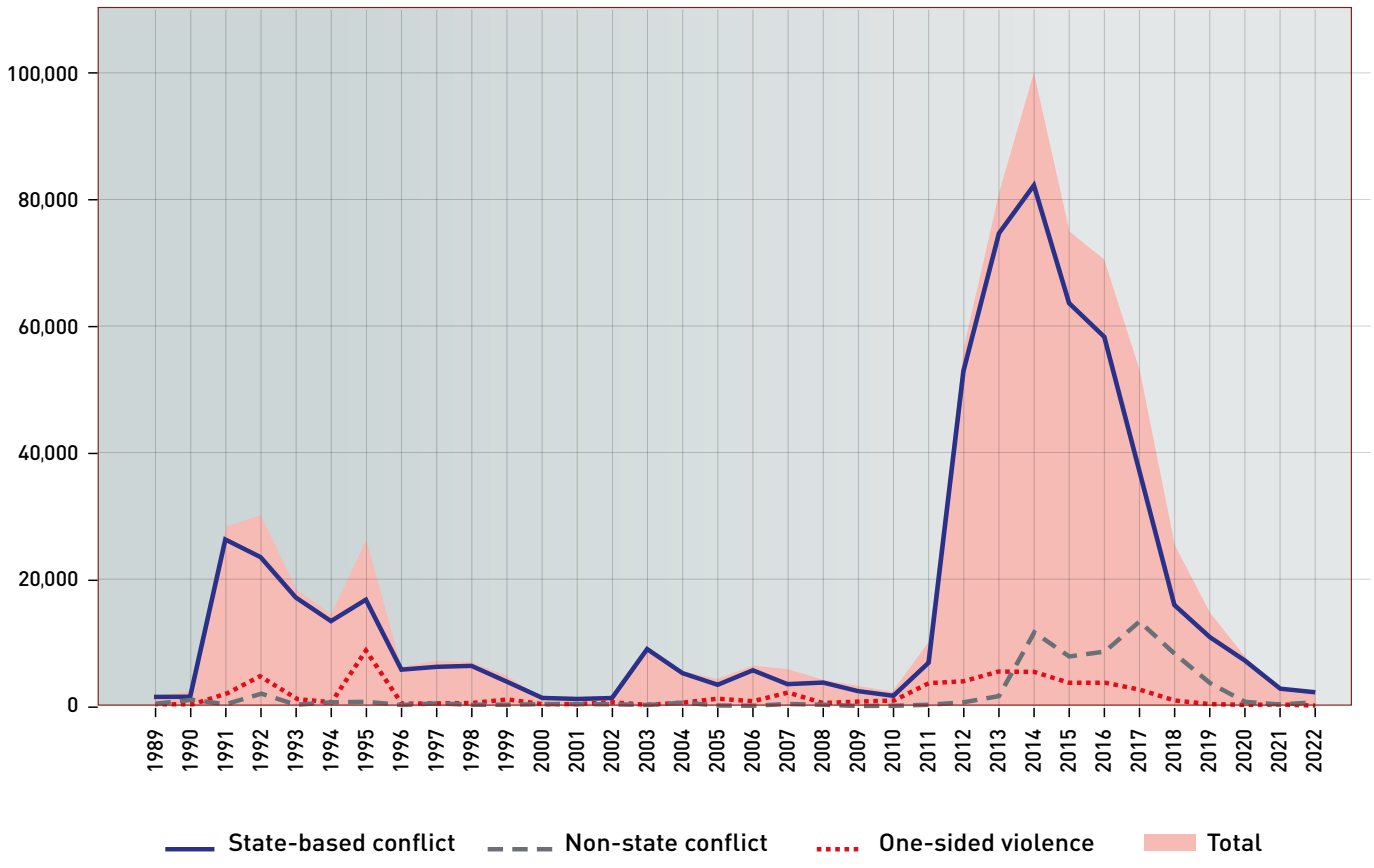

Figure 4.1 | Number of battle-related deaths between 1989 and 2022 in the Mediterranean. Source: Uppsala Conflict Data Program (UCDP), Davies et al. (2023).

4.2 The interaction between environmental change and conflict: empirical foundations

While climate and (civil) conflict appear to be correlated *(Figure 4.2)*, the interactions between climate change and conflicts result in the most severe impacts in countries or regions that are poor and highly dependent on agriculture for income and food production (Koubi 2019).

Major changes in weather patterns, in particular drought conditions, have coincided with the collapse of several previously powerful civilisations in the Aegean and Eastern Mediterranean (Kaniewski et al. 2015), as well as of empires such as the Akkadian Empire (Weiss et al. 1993; Weiss 2017; Carolin et al. 2019; Watanabe et al. 2019), and the Ottoman Empire (Kaniewski et al. 2015). Moreover, several studies provide evidence for a climate-conflict relationship associated with reduced agricultural production across many centuries. The Little Ice Age appears to have been associated with more cases of political upheaval and warfare in the Ottoman (White 2011; Haldon et al. 2014) and Byzantine (Xoplaki et al. 2016) Empires. In particular, the Gelali rebellions between 1550 and 1603 were reactions to social and economic crises stemming in part from climatic hardship associated with the Little Ice Age (see *Chapter 2, Section 2.5.1*). This evidence from historic antecedents, however, cannot be taken to suggest that recent or future changes in climate would lead to large-scale political collapse, mainly due to globalisation in the contemporary world (Butzer 2012).

Most of the recent research on the connections between climate change and conflict focuses on the effects of climate variability — mainly temperature, precipitation, and, to a lesser extent, extreme weather events as proxies for the kinds of longer-term changes that might occur due to climate change — on inter-state and intra-state conflict. Examples include civil conflict and/or civil war, communal violence, and low intensity conflict such as demonstrations, protests, and riots (Koubi 2019; Buhaug et al. 2023). A meta-analysis based on 60 studies finds that deviations from mild temperatures and normal precipitation systematically increase conflict risk, often substantially (Hsiang et al. 2013; see also Hsiang and Burke (2014) for another

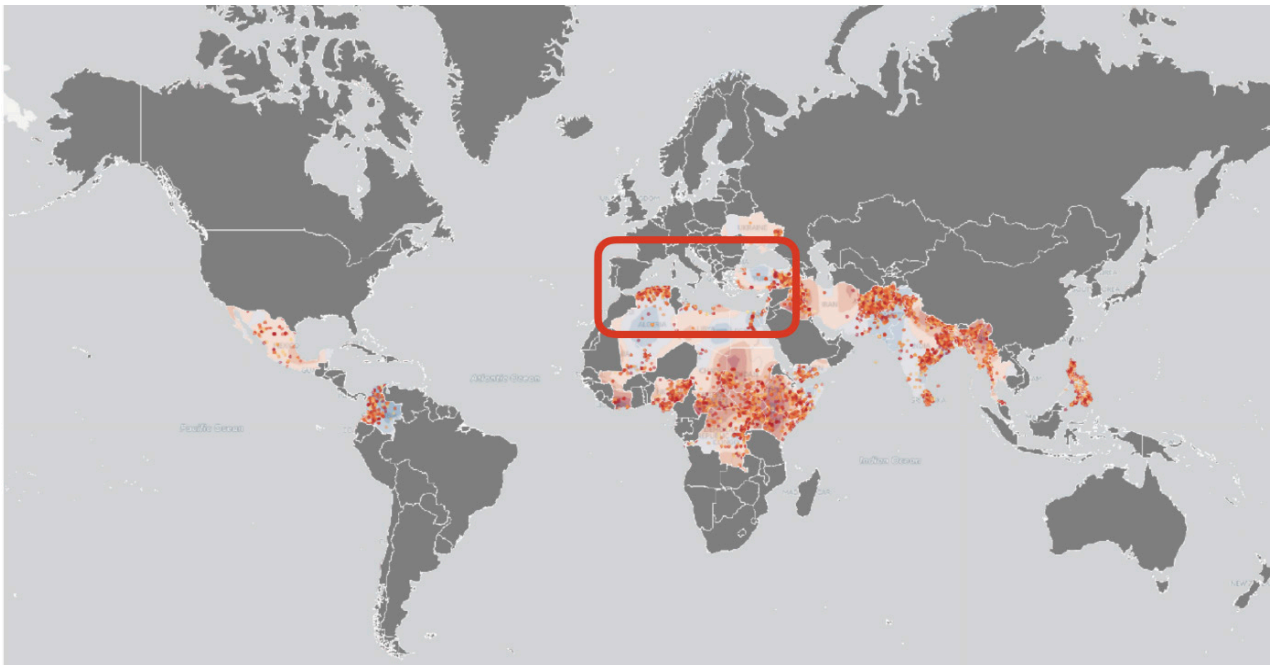

Figure 4.2 | Palmer Drought Severity Index (PDSI) (2005–2014) and location of armed conflict events (1989–2014). Results are screened for countries with more than one recorded armed conflict event per year. Red and blue shades represent drought and wet regions. Younger conflicts are shaded darker (red) than older conflicts (orange/yellow). Data: National Oceanic and Atmospheric Administration (NOAA) PDSI and Uppsala Conflict Data Program (UCDP) Georeferenced Event Dataset (GED). Adapted from Koubi (2019).

meta-analysis of 50 studies). However, this study has been criticised because its conclusion is misleading and at odds with recent empirical evidence (Buhaug et al. 2014). The UN Intergovernmental Panel on Climate Change Fifth and Sixth Assessment Reports (IPCC AR5; IPCC AR6) support the assessment of Buhaug et al. (2014) and assert that climatic changes can indirectly increase the risk of conflict by amplifying well-documented drivers such as socio-economic conditions. According to a global expert elicitation, major drivers for conflict risk include low socio-economic development, low state capabilities, intergroup inequality (e.g. ethnic differences), and recent history of violent conflict (Mach et al. 2019). Despite high uncertainty and the low ranking of climate as a conflict driver per se, growing climate variability and extreme climate events may exacerbate existing drivers of violent conflict. Abrupt climate-related events tend to have an indirect and conditional influence on conflict risk, for example through economic shocks, or by reducing the availability of natural resources, which in turn negatively affects agricultural productivity, food prices, and long-term socio-economic development (Mach et al. 2019, 2020).

Besides extreme weather events and environmental migration, potential indirect mechanisms and pathways linking climate and conflict include the degradation of natural resources. This includes the quality and availability of water and food, forests and biodiversity, and arable land and livestock, as well as combinations thereof, which are often locally constrained and associated with low-intensity farming (i.e. a low level of inputs used by the farm per unit of production factor) involving different land user groups (Buhaug et al. 2023). Exploring the complex linkages between climate variability, agricultural production, and the incidence of armed conflicts provides insights into how food resources affect violent conflict (Vesco et al. 2021). Long–term economic development and stability depend on access to and preservation of natural resources. These resources are vulnerable to climate-related hazards, with socio-economic and political consequences, which can spread across borders through spillover effects such as human displacement and social unrest (Scheffran et al. 2019). The situation is particularly critical in fragile and failing states, that is states characterised by agriculturally dependent and predominantly rural societies, social fragmentation, inadequate governance, and poor management capacities — typical of many Mediterranean countries.

There is, however, limited research on the climate-conflict nexus in the Mediterranean region, with contradictory results that differ according to the context under investigation, research design, methodological choice, and scope conditions used by the study. Different empirical cases help to understand the complexity of this relationship. For instance, climate variability measured as a deviation of the current level of precipitation and temperature from their past long-term levels did not affect the onset of armed conflict during the 1997–2009 period (Böhmelt et al. 2014). In addition, population pressure, agricultural productivity, and economic development were likely to have a stronger impact on water conflict risk than climate variability. The authors conclude that violent water conflicts are extremely rare, and that factors conducive to restraint, such as stable political conditions, may in fact stimulate cooperation. More recently, a study of civil conflicts in Africa and the Middle East for the 1992–2012 period finds that abnormally high temperatures decrease conflict risk in the Middle East, while they increase it in Africa. They also find that conflict risk peaks at about 32°C, which suggests that warm temperatures increase aggression to a certain point, beyond which they reduce it. In ad-dition, and more in line with expectations, more rainfall and above-average crop yields[55] decrease conflict risk (Helman et al. 2020). These heterogeneous findings led the authors to caution against broad conclusions regarding the climate-conflict links. Another study for countries in Africa and the Middle East region for the period between 1990 and 2017 finds that while long-term warming (trends and means) did not affect armed conflict, short-term changes either in temperature or precipitation (annual deviations) increased political instability and/or violent conflict. The authors conclude that their findings show that projected warming and increasing temperature

[55] In this study, crop yield production is proxied by the EVI2 vegetation index during the growing season. EVI is a satellite-based indicator of vegetation cover.

variability may increase violence in these regions, yet there is a need to understand the mechanisms of climate-conflict relationships (Helman and Zaitchik 2020).

Another study examines the relationship between climate change and political instability in 18 MENA countries for the period 1985–2016, using monthly data (Sofuoğlu and Ay 2020). It shows that abnormally warm years increased political instability and violence in countries already experiencing conflict, thus supporting the notion that climate change acts as a threat multiplier in MENA countries. A very recent study aims to identify the impact of rainfall variability on conflict incidence and onset, using a global panel dataset for the years 1989–2020 — including countries from the MENA region. This study shows that an increase in monthly rainfall decreases the risk of conflict incidence, but annual rainfall variability is not significantly linked to either conflict incidence or outbreak (Coulibaly and Managi 2022).

Climatic changes could also increase inter-communal violent events, such as conflict between herders and farmers or among pastoralists, by affecting their coping strategies to secure water and foliage. Given that most farming and pastoralism in Africa, including in the MENA region, are highly dependent on rainfall, reduced precipitation and resultant lower groundwater levels may contribute to an increased likelihood of conflict. In a common narrative, drought is pushing pastoralists to the farmlands of sedentary communities in search of forage, triggering dispute, violence, and conflict especially in areas lacking functioning conflict management. Detges (2014) shows that fighting is more likely to occur close to well sites in northern Kenya. Similarly, Döring (2020a) examines the impact of precipitation and groundwater access on violent communal conflict in the Middle East and Africa for the 1990–2014 period. The author finds that a lack of access to groundwater increases the likelihood of communal violence, and this effect is conditioned by precipitation levels and population density. Moreover, state presence and the provision of public goods dampen the effect of difficult groundwater access on conflict.

Regarding low-intensity conflict, Ide et al. (2020a) examine the effect of drought on the onset of non-violent, water-related conflict in the MENA region between 1996 and 2009. They report that conflicts over water cannot generally be linked to drought, because their findings show that pre-existing social divisions combined with either autocratic political systems or the reduction of public water supply are crucial factors in distinguishing between peaceful and conflictual locations, while economic development is less relevant.

A growing body of research examines the connections between extreme weather events, such as storms, floods, or droughts, and conflict (Schleussner et al. 2016; Ide et al. 2020b). These events can cause or worsen scarcity, by damaging public and private infrastructure, destroying crops, and killing livestock, subsequently leading to conflict. The direct association between natural disasters and armed conflict is contested. On the one hand, Vestby (2019) analyses Afrobarometer[56] data in which respondents were asked about their participation in politically-motivated violence, as well as how their living conditions had changed over the past year (using the Standardised Precipitation Evapotranspiration Index (SPEI)[57]). The study finds that individuals who had experienced a deterioration in living conditions due to droughts are more likely to use force or violence for a political cause. On the other, Feitelson and Tubi (2017) examine the effect of the extreme 2007–2010 drought on armed conflict in the Euphrates and lower Jordan River basins and find that, except for Syria, and the consequent spillover into Iraq, droughts do not constitute a main driver of armed conflict in the Middle East. They conclude that droughts may lead to conflict when more fundamental factors, especially adaptive capacity, have been compromised.

There is also some evidence that widespread disasters generate solidarity and cooperation rather than conflict. For instance, Tubi and Feitelson (2016) examine conflictual and cooperative

[56] https://www.afrobarometer.org/

[57] https://spei.csic.es/

interactions between Muslim Bedouin herders and Jewish agricultural settlements in Israel's semi-arid northern Negev region during the drought between 1957 and 1963. They find that while the interactions between these two groups ranged from violent clashes to extensive cooperation and assistance, conflict was limited. The measures taken by state institutions to directly reduce friction and provide relief assistance were central to the overall limited level of conflict. Finally, Döring (2020b) uses disaggregated event data covering the Mediterranean area and the greater MENA regions for the period between 1997 and 2009 to examine the effect of water scarcity on incidences of domestic water cooperation. He finds that low groundwater tables increase the chance of both conflictual and cooperative events over water, as well as state- and non-state-initiated cooperative events, with effects being more pronounced for the water scarce Arab region. Moreover, the effect of groundwater in fostering non-state-initiated cooperative events holds only in regimes characterised by lower political participation, while state-initiated cooperative events are more likely in areas that have recently experienced an armed conflict. Finally, precipitation and agricultural droughts are found to have a negligible and insignificant effect on water-related interactions (conflictual, neutral or cooperative), as well as state- and non-state-initiated water cooperation.

Several recent studies identify a causal link between higher food prices, caused by climate-induced changes to agricultural production, and social unrest in Africa (Berazneva and Lee 2013; Raleigh et al. 2015), while Buhaug et al. (2015) do not find support for such a relationship. Rising food prices associated with extreme weather events in crop producing regions (notably in China and Russia) are considered to have played a significant role in fomenting the Arab Spring unrest across North Africa and the Middle East in 2011 (Sternberg 2012; Newman 2018) where protests and riots led to political change in Egypt, Libya, and Tunisia (Sottilotta 2015). However, others show that such forms of violence are triggered more by a complex set of political and economic factors combined with government failures than by single factors such as higher food prices (Sneyd et al. 2013; Devarajan and Ianchovichina 2018; Al-Shammari and Willoughby 2019). Food security policies adopted by a specific government helped to avert revolution, as seen in Morocco compared to Egypt and Syria (Soffiantini 2020).

More controversial is the Syrian civil war, where there is no consensus on the role of climate as a contributing factor. Before the Syrian rebellion started in 2011, a prolonged drought hit the Fertile Crescent region (2007 to 2009). The drought exacerbated the vulnerability of rural populations, increased agricultural losses, and forced deprived farmers to move from rural areas to the capital, thereby elevating tensions and pressures on an autocratic system with poor management and governance. The role of climate variability in the Syrian conflict is therefore disputed. Some studies highlight the catalytic effect of the drought on the conflict (Gleick 2014; Kelley et al. 2015), while others contest the drought's impact and instead blame failed government policies for the escalation of tensions (Selby et al. 2017; Daoudy 2020). Reviewing the evidence, Ide (2018) concludes that there is poor understanding of whether large economic losses or rural-urban migration were relevant in the urban unrest. While environmental factors may have played a role in the early phase, political factors, such as the repressive response by the regime, were more clearly associated with the protests and escalation. Other destabilising drivers were the US invasion of Iraq in 2003, the Arab Spring, regional power rivalries, and the emergence of the 'Islamic State'. In fact, neighbouring countries like Jordan, which also suffered from the drought, did not experience a civil war. These competing claims indicate that compounding and cascading effects in both natural and social processes preclude simple statements on dominant or even single causal mechanisms in the Syrian or conflict, or others. Eklund et al. (2022) show that an agricultural collapse cannot be substantiated, as croplands in Syria experienced a fast recovery after the 2007–2009 drought, questioning the drought-migration-conflict narrative for the Syrian civil war.

Finally, some studies examine whether climatic events can increase the probability of inter-state conflict by reducing the supply of water in transboundary river basins. Despite the threat of 'water wars' prominently featured in the media and policy discourse since the early 1990s, shrinking shared water resources, while potentially contributing to tensions, threats, and even some localised violent episodes, are unlikely to lead to

war (Wolf 2007). In fact, joint precipitation scarcity is found to reduce the likelihood of inter-state militarised dispute (Devlin and Hendrix 2014), as water scarcity enhances the incentives of riparian states to cooperate, rather than to fight (Dinar et al. 2011). In addition, research shows that the risk of conflict is further mitigated by the liberal institutional and economic structures of riparian states (Feitelson and Tubi 2017), commercial treaties (Dinar et al. 2015), the behaviour of upper riparian states (Feitelson and Tubi 2017) and upstream-downstream relations (Munia et al. 2016), the existence of transboundary treaties (Tir and Stinnett 2012), the number of agreements between riparians states (Dinar et al. 2019), the specific design of international water agreements (Dinar et al. 2015), and institutional frameworks for flexible but specific water allocation mechanisms (Dinar et al. 2015; Oktav 2017).

While research shows that in the context of transboundary freshwater resources, the prevailing response is cooperation, non-violent conflict is nevertheless quite frequent (Bernauer and Böhmelt 2020). Conflict is possible within a basin in the absence of transboundary institutional mechanisms able to manage the effects of rapid or extreme change to physical or institutional systems (Wolf et al. 2003). Dams and water infrastructure, while able to help manage water variability and provide water in times of drought, or dampen the effects of floods, can also substantially change the hydrological function of the basin where they are built (see also *Section 4.5*). Overall, hydrological disputes in the Euphrates, Jordan, Nile, and Tigris River basins are more often seen as part of territorial security and development-related concerns than as a genuine water issue (Link et al. 2016). However, climate change may affect future inter-state relations and undermine the stability of existing water institutions where they are incapable of accommodating change (Dinar et al. 2015; Ide et al. 2016; De Stefano et al. 2017). A systematic review of empirical research on the complex relationship between abrupt climate events and violent conflict in the MENA region suggests several avenues for future research, including the implications of floods and heat waves, non-agricultural sectors such as the critical oil and gas sector, society's ability to cope with weather extremes, and prior governmental mismanagement of land, water, and conflict dynamics (Kim and Garcia 2023).

4.3 Climate and conflict projection

Although climate has not had a straightforward impact on the risk of conflict in the Mediterranean thus far, a future characterised by increasing temperature and more severe and frequent extreme climate events may increase the likelihood of conflict. A growing body of literature aims to predict the extent to which climate change will affect conflict in the decades to come. The most relevant projection studies for the region of interest are summarised in *Table 4.1*. An increasing number of these analyses rely on machine learning tools, which are sufficiently flexible to avoid parametric assumptions, while also accounting for the interactive effects that characterise the climate-conflict nexus (Ge et al. 2022; Xie et al. 2022).

Among existing studies that predict the impact of climate on conflict, only a handful focus on short-term predictions for one to five years ahead, while the majority investigates long-term, multi-decadal impacts throughout the 21st century, using climate and socio-economic scenarios in line with the RCP-SSP framework developed by the IPCC (2021). Existing short-term forecasting studies report that climate and environmental variables marginally contribute to predicting armed conflict, and their role is modest compared to poverty, agricultural dependence, population density, level of socio-economic development, ethnic fractionalisation, and other drivers of societal vulnerability (Theisen et al. 2021). This is in line with empirical research showing that climate only has a contextual and indirect influence on the risk of conflict, which is highly dependent on the vulnerability of the affected population (Buhaug and von Uexkull 2021). Similarly, the final report of the Sahel Predictive Analytics initiative led by UNHCR lists societal vulnerability to climate hazards, and especially climate-driven challenges to food and livelihoods, as a main driver of conflict risk in the short-term future (Blocher et al. 2022). Such studies are also relevant for the wider MENA region.

Long-term projections largely confirm a minimal and indirect contribution of climatic drivers to predicting conflict risk in the region. For example, using an open-source machine-learning model, Hoch et al. (2021) find that the importance of hydro-climatic indicators is limited compared to socio-political and historical conflict predictors. However, the influence of climatic indicators is expected to vary according to different climate scenarios and across locations.

Simulations generally find the African part of the Mediterranean to remain at low risk of violence (Busby et al. 2014; Hoch et al. 2021) relative to conflict-ridden Sahel and Sub-Saharan Africa (Hendrix and Glaser 2007; Witmer et al. 2017; Petrova et al. 2023). In the North African region, Hoch et al. (2021) predict that the provinces of El Oued and Ouargla in Algeria, and southwestern areas of Morocco bordering West Sahara, have the highest probability of climate-related conflict in North Africa. This is seen particularly under pessimistic climate scenarios, which assume a global temperature increase of between 2.7°C and 3.6°C by the end of the century. Increased temperatures by the end of the century are expected to negatively impact agricultural production. This could, in turn, contribute to rising food prices and food insecurity, leading to protests and riots against the government (see also Waha et al. 2017; Scheffran et al. 2019).

Due to the strong dependence of North African countries on agriculture for their Gross Domestic Product (GDP) and employment, climate change can undermine food security, economic stability, resilience, and overall livelihood prospects in the region, indirectly contributing to social instability. A possible strategy to mitigate climate change impacts on security is therefore to reduce economic and livelihood dependence on rain-fed agriculture, strengthen sustainable land use practices, and increase adaptive capacity and regional cooperation (Schilling et al. 2020). Although climate change may increase the risk of violence in some parts of Algeria and Morocco within North Africa (Schilling et al. 2020; Hoch et al. 2021), the overall region will continue to be more stable than Sub-Saharan Africa and the Sahel: Morocco and Tunisia are predicted to experience lower risks of climate-related conflicts than other African countries by 2050 (Busby et al. 2014). Projections show that Africa as a whole is likely to continue to be burdened by conflict throughout the century. For example, Burke et al. (2009) project that a 1°C temperature increase across the continent will lead to a 54% rise in the average likelihood of conflict in Sub-Saharan Africa, corresponding to a total of additional 393,000 battle deaths by 2030. However, Buhaug (2010) shows that this result is not robust to alternative model specifications, and finds that climate variability, measured as interannual growth

and deviation from annual mean precipitation and temperature, is a poor predictor of civil conflict. These contradictory findings not only reflect the complexity of the relationship between climate change and conflict; they may also be driven by the uncertainties that characterise long-term projections of complex social phenomena, especially due to data limitations and challenges in the validation and testing of model results.

Projections for the Middle East similarly point to a higher risk of climate-related conflict than for North Africa. Combining a literature review with simulations of regional climate impacts, Waha et al. (2017) find that under a 4°C warming scenario, the decline in agricultural productivity and resulting pressure on food and water resources are likely to induce rural to urban migration and trigger social unrest in the Mashreq and Maghreb regions.

An analysis of the compound effects of temperature and precipitation projections for the Middle East (Dezfuli et al. 2022) points to Tigris-Euphrates headwaters as a hotspot of future climate impacts in the region, due to a combination of high temperature, reduced precipitation, and increased rainfall variability. The authors highlight that in a situation of changing climate, the potential for water-related conflicts and migration is especially considerable around the southeastern Anatolia Project irrigation initiative, due to threats to project viability and impacts on downstream water security.

However, projections of conflict risk may be optimistic, and fail to incorporate the complexity and feedback loops that characterise the climate-conflict relationship, due to methodological challenges and data-related limitations. For long-term conflict projections, simplistic modelling assumptions may drive estimates of conflict risk down. For example, simulating armed conflict and economic growth simultaneously throughout the 21st century, Petrova et al. (2023) find that adjusting current economic projections by taking into account possible conflict impacts leads to 25% lower estimates of global average GDP growth, compared to existing economic projections that do not account for the negative effects of conflict on economic growth. As GDP is both a fundamental driver of armed conflict (see Collier 1998; Ward et al. 2010) and may be negatively affected by climate change, these findings suggest that current projections of conflict risk may be underestimated.

Table 4.1 | Overview of the empirical studies that forecast/project future climate-related conflict risks. The overview only includes studies from the region of interest.

Reference	Time horizon	Spatial scope	Methods	Conflict drivers	Conflict predictions in the Mediterranean region
Blocher et al. (2022)	2022	The Sahel	Machine learning models	Political, socio-economic and demographic variables	Low risk of conflict in Gambia, Guinea, Mauritania, and Senegal
Busby et al. (2014)	2060	Africa	Composite vulnerability modelling	—	The Nile Delta, and few hotspots in Morocco
Hoch et al. (2021)	2050	Africa	Machine learning models	The importance of climate indicators is limited compared to non-climatic predictors	El Oued and Ouargla in Algeria, southwestern areas of Morocco bordering Western Sahara, and Mauritania
Waha et al. (2017)	2090	MENA region	Combination of literature review and simulations of climate impacts	Pressure on resources could contribute to social unrest in the MENA region	Algeria and the Nile Delta

4.4 Conflict and migration

Existing research emphasises the role of conflicts in driving human migration decisions. In addition, most research on involuntary migration tends to conclude that displacement is an obvious consequence of conflict, and that people flee because they have no choice. The Internal Displacement Monitoring Centre (IDMC) of the Norwegian Refugee Council estimated that an unprecedented 53.2 million people were living in internal displacement because of conflict and violence at the end of 2021, across 59 countries and territories. Conflict and violence triggered one million internally displaced persons (IDPs)[58] in the MENA region in 2021, less than half of the 2.1 million recorded in the previous year, and the lowest figure for the region in a decade. The decrease was mainly the result of de-escalation conflict in Iraq, Libya, and Syria. While these countries continued to experience instability, conflict reignited in Gaza in May 2021, triggering more than 117,000 displacements, as well as small-scale displacements in Lebanon and Israel. In 2022, conflict in Syria and Yemen resulted in the displacement of 450,000 people. Across the region, the number of people living in displacement at the end of 2022 because of conflict and violence reached 12.7 million.

Conflict influences migration in direct and indirect ways. It can directly affect migration by causing civilians to perceive a higher level of threat than they are willing to tolerate. When faced with significant dangers and

[58] According to the Guiding Principles on Internal Displacement (UN 1998), internally displaced persons (IDPs) are 'persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters, and who have not crossed an internationally recognized border.' See also: https://www.ohchr.org/en/special-procedures/sr-internally-displaced-persons/about-internally-displaced-persons

ongoing adversities associated with armed conflicts, many have no other option but to leave their homes (Davenport et al. 2003; Moore and Shellman 2004, 2006; Adhikari 2012). Conflict can also indirectly affect migration by reducing economic opportunities, since without sufficient income, many civilians choose to move (Betts 2013). Notwithstanding the debate over whether human migration is fundamentally different when violence or economics are the direct causes of migration, physical and economic insecurity are strong drivers of conflict-induced migration since they entail both motivation and opportunity (Schon 2019).

4.5 Conflict, climate hazards, vulnerability, and adaptation

The relationship between conflict, climate hazards, and vulnerability is inherently endogenous: both climate-related impacts and conflicts increase the vulnerability of exposed societies to future climate hazards (Buhaug and von Uexkull 2021). Conflicts have been associated with a number of detrimental impacts on societal development: they deteriorate livelihood and food security, impair physical and psychological health, and the well-being of exposed individuals, deteriorate access to freshwater, harm economic growth, and weaken educational attendance (Gates et al. 2012). Conflicts may thus turn climate hazards into disasters through amplifying risks and vulnerabilities across multiple institutional and temporal scales (Peters 2022). As illustrated in *Figure 4.3,* climate hazards and conflict might compound each other in a vicious circle, which traps affected societies in a spiral of recurring violence, increased vulnerability, and harmful climate impacts (Buhaug and von Uexkull 2021). Climate hazards and conflicts may both increase societal vulnerability to future hazards, but the effect of compound risks can be even more detrimental to exposed societies. Combined exposure to socio-political crises and extreme climate events can lead to a cascade of temporally- and spatially-dependent risks (Zscheischler et al. 2018), which may mutually reinforce and increase societal vulnerability to future hazards. As disasters are a product of social constructs beyond the natural event itself, the devastation induced by violence can contribute to shaping climate hazards into disasters (Peters 2022). The compound effect of violence and climate-related disasters may be more detrimental to societal vulnerability than the occurrence of a single event: it is not a coincidence that the most severe humanitarian crises occur in areas exposed to a combination of human and natural hazards (von Uexkull and Busby 2018).

However, studies of the impacts of conflict and climate hazards on vulnerability remain limited, and further efforts are necessary to better understand the 'human dimension' of the climate risk and conflict nexus (Augsten et al. 2022). Peters (2022) carried out in-depth interviews with Disaster Risk Reduction (DRR) experts in 25 conflict-affected countries, including in the Middle East, and found that conflicts exacerbate existing vulnerabilities and reduce coping capacities. This is caused by harming the physical and psychosocial well-being and health of affected households, disrupting and destroying livelihoods, destroying and damaging infrastructure, and forcing people to migrate. Similarly, Marktanner et al. (2015) use a cross-sectional time-series analysis on disaster deaths to assess how conflicts shape the impact of climate hazards. They find that the death toll from a disaster is, on average, 40% higher when it is followed by a conflict, and suggest that the legacy of a conflict casts a long shadow over a country's climate adaptive capacity.

Developing and implementing adaptation plans and initiatives may be a strategy for alleviating disaster and conflict risks (Tänzler et al. 2010). A regionally specific assessment of climate risks is a precondition for containing vicious circles of insecurity, violent conflict and forced migration (Cramer et al. 2018). Adaptation projects can help counter the effects of climate change on natural resources, food security, livelihoods, and the potential for economic loss (Pörtner et al. 2022), and as a result, reduce the conflict potential of climate variability. Nevertheless, existing empirical research has mostly disregarded the role of adaptation to climate as a component of human security (Babcicky 2013; Biagini et al. 2014). Most of these studies have implicitly assumed that by reducing climate change impacts, adaptation would reduce the risk of conflict (Tänzler et al. 2010). However, poorly designed adaptation, especially when inefficient, may also contribute to an increased potential for conflict. In this context, some theoretical studies have highlighted that since conflicts are not caused by climate change itself, but by human reactions to it (Babcicky 2013), adaptation projects might carry their own conflict potential independently of climate impacts (Scartozzi 2020). These studies have theorised that adaptation can cause unintentional changes to power structures, raise issues of distributive and procedural justice, and trigger resource competition, overall opening up new opportunities for armed conflict as well as for cooperation (Tänzler et al. 2010).

Adaptation may disproportionately affect some socio-economic, age, ethnic, or gender groups, trigger changes in resource availability or access to resources, and lead to shifting power structures and institutional changes (Biagini et al. 2014; Scartozzi 2020). The impact of external financial help to support adaptation projects may also contribute to rent-seeking and other forms of corruption in receiving countries, especially in systems characterised by

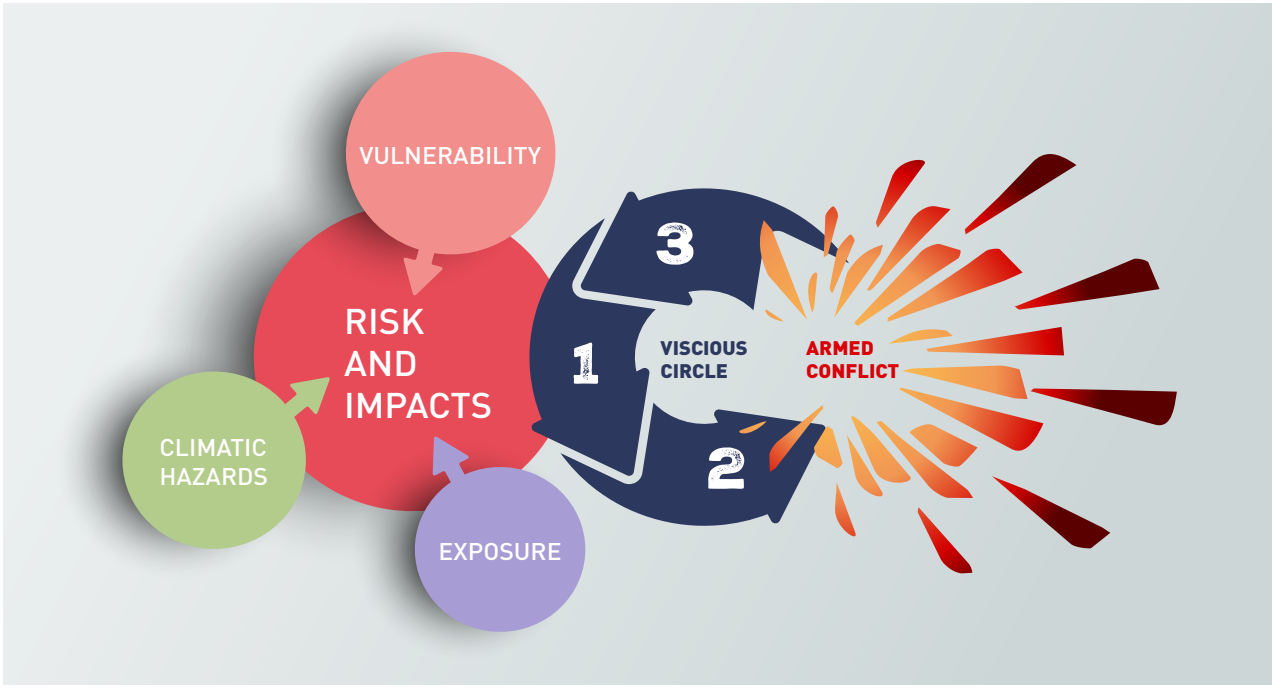

Figure 4.3 | Conceptual diagram illustrating the interlinkages between climate hazards, armed conflict, and societal vulnerability. Source: Buhaug and von Uexkull (2021).

weak governance. By and large, initiatives to adapt to the effects of climate change may have a destabilising potential, especially if critical competing interests are not taken into account during the planning process. It is therefore not unlikely that adaptation would lead to unexpected forms of conflict (Yanda and Bronkhorst 2011). For example, infrastructure projects such as dams or dykes may affect relationships between riparian states, as the construction of a dam may reduce the availability of water for downstream countries while benefiting upstream states. The construction of large dams in upstream riparian states without an agreement in place was found to be one of the strongest indicators of a basin's potential hydro-political tension (Wolf et al. 2003). The Nile river basin area is a case in point, showing evidence of both cooperative and conflictual relations across states, while hydro-politics in the region have generally fostered transboundary cooperation, as epitomised by the Nile Basin Initiative[59] (Homer-Dixon and Deligiannis 2009). The Ethiopian plan for a 'Grand Ethiopian Renaissance Dam' (GERD) in 2011 escalated tensions with Egypt around water security, adding to a climate of dispute between upstream and downstream states that had characterised negotiations in the early 2000s around the Nile River Basin Framework Agreement[60] (Tayie 2016). News of the GERD construction was greeted by violent protests in Egypt and strong rhetoric from Egyptian politicians (Gebreluel 2014). Similarly, the Turkish GAP project[61], involving the construction of 22 dams and 19 hydropower plants along the Euphrates River, spurred tension between Türkiye and downstream countries, Syria and Iraq, further aggravated by competition for leadership in the area (El-Fadel et al. 2002).

The risk of unintended negative effects in fragile contexts therefore needs to be addressed in the implementation of climate adaptation and mitigation policies. Successful transformation requires climate-sensitive and conflict-sensitive mitigation and

[59] https://nilebasin.org/

[60] https://nilebasin.org/about-us/cooperative-framework-agreement

[61] https://en.gap.gov.tr/page/about-gap/whats-gap/

adaptation that minimise the potential for conflict and resistance (Nadiruzzaman et al. 2022, 2023). Examples include land use conflicts with local communities over bioenergy (e.g. palm oil plantations), wind and hydro power, carbon capture and geoengineering, strategic metals, or construction of dams (Scheffran and Cannaday 2013). The challenge is to avoid these side-effects and to realise potential co-benefits and synergies between different institutions and frameworks towards integrated approaches. Sectoral organisations and multilateral institutions can facilitate access to climate finance mechanisms and implement integrated initiatives for resilience-building and humanitarian assistance, conflict prevention and environmental peacebuilding. Although adaptation remains underfunded, parties to UNFCCC COP 28 signalled renewed ambition for the Loss and Damage Fund and agreed on new funding arrangements for supporting developing countries that are particularly vulnerable to the negative impacts of climate change. These agreements represent a promising development in financing adaptation initiatives in the most vulnerable countries, and may encourage positive changes in the Mediterranean region.

4.6 Conflict resolution, climate governance, and environmental peacebuilding

Although the Mediterranean region lacks formal cooperative security institutions, avoiding climate-related instability and conflict is a high priority to prevent already fragile states from sliding into further conflict or instability. This is especially important in fragile countries that often have low adaptive capacity and climate finance, such as Syria, Lebanon, Libya, Iraq, and Egypt in the Mediterranean (according to the Fragile States Index) (Nasri et al. 2021).

The environmental peace literature investigates how environmental cooperation can contribute to peace, transforming conflict through building trust, confidence, and the participation of stakeholders, for example through equitable sharing of common goods and natural resources, such as water (Ide 2018; Swain and Öjendal 2018; Ide et al. 2021). Effective interventions break the links between climate impacts and conflict risks in intergovernmental, national, and local contexts (Mach et al. 2019). In particular, climate-conflict resolution can combine socio-ecological and conflict transformation, risk reduction, climate change adaptation, sustainable development, humanitarian aid, and peacebuilding — strengthening resilience to climate-fragility risks and realising significant co-benefits.

Addressing these challenges involves a number of strategies and approaches. First, sustainable development aiming for an equitable balance of natural resources and human needs can be an essential contribution to cooperative conflict prevention and resolution (Scheffran 2016). Appropriate institutional mechanisms and legal regimes can leverage synergies and design integrated solutions from different policy fields in the climate-conflict nexus. To this end, a sufficient amount of traditional investment in hard security needs to be shifted to soft security, particularly in climate mitigation and adaptation (Brock et al. 2020). Climate mitigation and emission reductions are essential to prevent climate security risks, conflicts, and instabilities. Risk minimisation and management aim to contain and minimise threats, while anticipation and adaptation support actions that seek to avoid, minimise, and respond to potential climate impacts. 'Conflict-proofing' of climate adaptation plans diminishes conflict potential by minimising risks, limiting threats, and preparing societies against adverse climate impacts. In order to improve local coping capacities and resilience, while minimising vulnerabilities to climate impacts, governments in the Mediterranean could benefit from increased international cooperation to break down barriers and obstacles to climate diplomacy, by turning climate into a security issue (securitisation)[62], insufficient financing, and a lack of cooperation.

Second, a fair and just transition to low-carbon energy production and use can take into consideration existing inequalities between southern and northern Mediterranean countries, indicated by different measures of well-being, economic development, government effectiveness, and social networks (Moneer 2020). Marginalised individuals and groups have lower capacities for absorbing new economic shocks, which implies that some countries or regions are more affected than others. In line with the 'Polluter Pays' principle, industry needs to pay a fair share of environmental costs and damages (Healy and Barry 2017). International financial assistance can help countries that are more vulnerable to climate change risks and have lower adaptive capacity and less responsibility for historical greenhouse gas emissions (Muttitt and Kartha 2020). This counteracts climate change as a driver of conflict, constrains the conflict-sensitivity of societies, and strengthens sustainable peace and environmental peacebuilding.

Moreover, including established procedures of conflict prevention, civil conflict management, and conflict resolution in peace and security policies

[62] The concept of 'securitisation' is used in this Analysis as defined in international relations and political science, particularly within the framework of the Copenhagen School (Buzan et al., 1998). Securitisation refers to the process through which an issue is constructed as an immediate and existential threat by a powerful actor—such as a government or political leader—through a speech act. This construction must be accepted by a relevant audience to legitimise the use of extraordinary measures beyond normal political procedures. As used in this Analysis, securitisation concerns the construction of issues as security threats, not the financial meaning of the term (i.e. the pooling and repackaging of assets into tradable securities). See also *Chapter 6, Section 6.2.*

contributes to reducing conflict risks and improving human security. Collective efforts to address climate change can be an opportunity not only for socio-ecological transformations, but also for civil conflict transformation (Pastoors et al. 2022). Since climate conflicts are often based on power inequalities, addressing and dismantling environmental injustice is one of the central steps in conflict transformation towards environmental peacebuilding (Holifield et al. 2020), which critically exposes and constructively changes power inequalities. To manage conflicts, a negotiation process involves key stakeholders negotiating their interests, resources and means available, and the strategies to balance them. Conflict transformation includes constructive conflict resolution, peacebuilding, and violence prevention measures in crisis and conflict regions, such as round tables, facilitation and dialogue forums, mediation and conciliation, diplomacy, human rights monitoring, conflict-sensitive journalism, remembrance work, and psychosocial support (Pastoors et al. 2022). As an example of environmental peacebuilding, EcoPeace Middle East[63] aims to promote cooperative efforts to protect the shared environmental heritage of Israel, Jordan and Palestine, by bringing communities of the three countries together to work on common issues in a highly politicised environment (Schilling et al. 2017). Ecopeace's Good Water Neighbors (GWN)[64] project works with communities and municipalities across the three borders to develop a regional understanding of the problems, raise awareness of the shared water reality, create political will for transboundary cooperation, and build trust in order to solve issues of water pollution and allocation. In the Regional Water Data Banks Project, regional countries work together, while being supported by technical and financial assistance from the European Union (EU), France, the Netherlands, and the United States Agency for International Development (USAID). The Nile Basin Initiative[65] is an intergovernmental partnership of ten Nile Basin countries, to achieve sustainable socio-economic development through the equitable use of, and benefit from, common Nile Basin water resources. The Nile Basin Discourse[66], a network of civil society organisations within the Nile Basin region, runs alongside this, offering a complementary public platform for dialogue (Carius 2007).

Cooperative platforms, interagency frameworks and multi-institutional processes are beneficial for bridging diverse interests across the region and establishing rapid response mechanisms. Climate diplomacy practices are implemented by a broad range of actors, including national and local governments involved in policymaking, international organisations, such as the United Nations (UN) and the EU, Non-Governmental Organisations (NGOs), and donor funding projects. Regional partnerships and initiatives can connect global and local actions, jointly address climate-fragility risks, and improve resilience, engaging with existing networks, fora, and conferences (Scheffran 2021).

Multilateral dialogue providing frameworks for climate diplomacy already coexists at different levels (European External Action Service (EEAS), North Atlantic Treaty Organization (NATO), Organization for Security and Co-operation in Europe (OSCE), UN, but with little interaction between them. More improvement is needed, and synergies need to be utilised. While multilateral efforts could achieve progress in regional contexts, constructive engagement by key powers outside the Mediterranean (China, Iran, Russia, Saudi Arabia, the USA) could increase the chances of stability. This requires a shift away from geopolitical conflict to cooperative pathways in North-South or South-South frameworks (Ehteshami et al. 2017). In this context, migrant social networks can serve as a transformative force for building social resilience, climate adaptation, sustainable co-development, and conflict transformation (Scheffran et al. 2012; Adger et al. 2024).

Multi-issue regimes among Mediterranean states include the Barcelona Declaration of 1995

[63] https://ecopeaceme.org/

[64] https://panorama.solutions/sites/default/files/gwn_project_overview_updated_july_2015_1.pdf

[65] https://nilebasin.org/

[66] https://www.nilebasindiscourse.org/

establishing a Euro-Mediterranean partnership and its 2008 successor, the Union for the Mediterranean. Both instruments and frameworks have faced substantial challenges in promoting Euro-Mediterranean cooperation and integration (Scheffran and Brauch 2014). These regimes provide frameworks for discussing issues of common concern (e.g. migration and health, food, energy and water, climate, environmental and civil protection, employment, and security), but have struggled due to pre-existing political and geopolitical fractures among Mediterranean states, as well as perennial intra-EU divisions over policy priorities and interests.

Various institutional frameworks can be used for promoting climate diplomacy in the Mediterranean (see Scheffran 2021). For example, a Mediterranean New Deal could offer a framework for cooperation and joint initiatives. Together with the EU Green Deal (EC 2021c) and the Fit for 55 initiative (EC 2021a), the New Agenda for the Mediterranean (EC 2021b) offers an ambitious and innovative framework for relaunching and strengthening the strategic partnership between the EU and Southern Neighbourhood partners, including a dedicated Economic and Investment Plan to spur long-term socio-economic recovery. To support MENA states, including the southern and eastern Mediterranean countries with shared benefits and technology transfer, development aid could be combined with co-development and co-production. The 2011 New Deal for Engagement in Fragile States[67] has endorsed a number of principles for better understanding and responding to relevant compound risks associated with climate fragility (Hingorani 2015).

[67] https://capacity4dev.europa.eu/groups/public-fragility/info/new-deal-engagement-fragile-states_en

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