AEJI
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AEJI
העמותה לצדק סביבתי (ע"ר)
المنظمة للعدل البيئي
Association of Environmental Justice in Israel (AEJI)

The Porter School of Environmental Studies

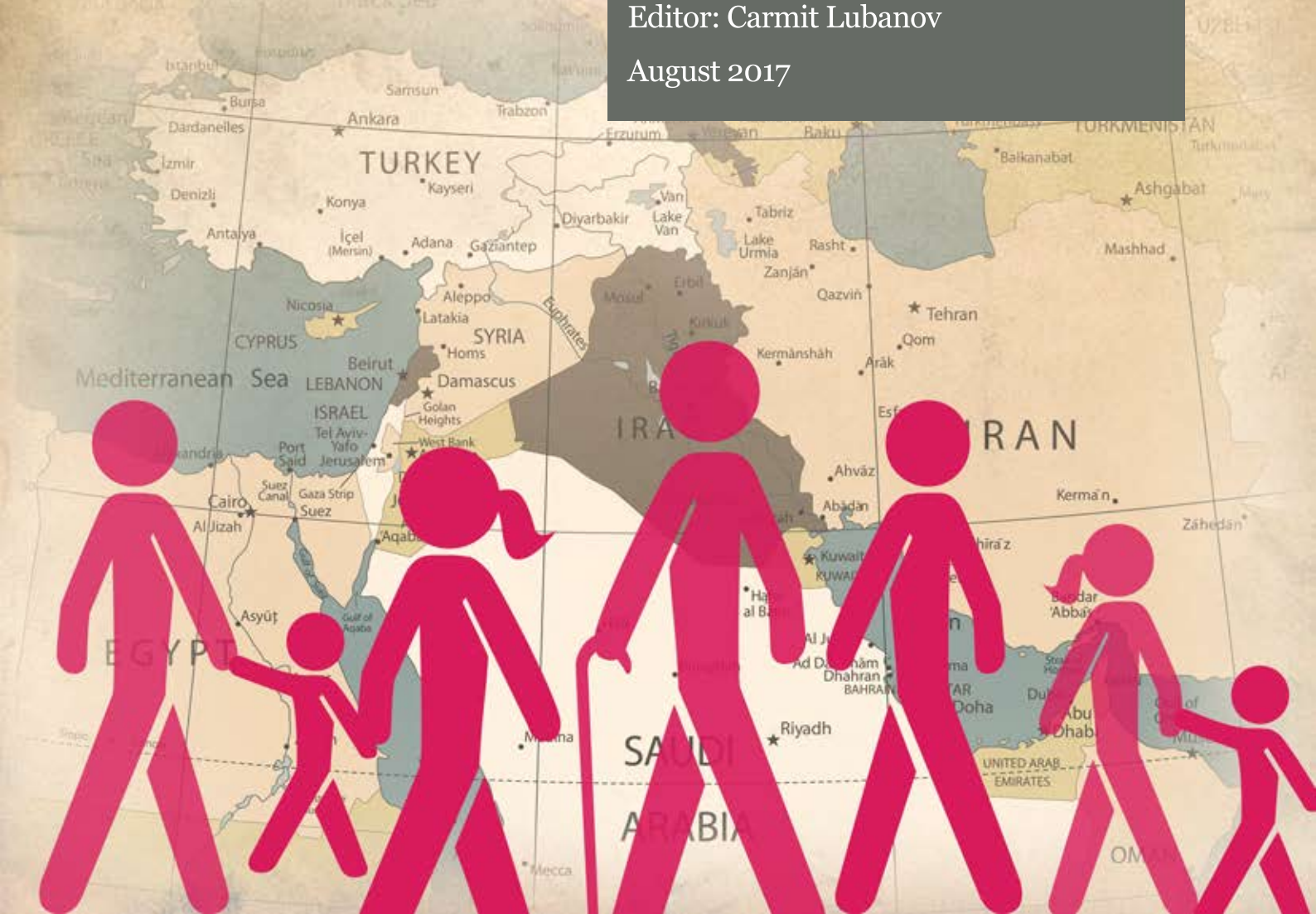
TEL AVIV UNIVERSITY
Pursuing the Unknown

Mitigation of Climate Risk and Adaptation to Climate Security In Israel and the Middle East:
Policy Measures toward Geopolitical Cooperation and Regional Transformation

Joel Adam Gordon

Editor: Carmit Lubanov

August 2017



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Acronyms and Abbreviations

AEJI	Association of Environmental Justice in Israel
CNA	Corporation Center for Naval Analyses
CCF	Climate Compatible Future
CCL	Climate Change Leadership
CSAG	Climate Systems Analysis Group
CSOs	Climate Stress Operations
EEA	European Environment Agency
ENSO	El Niño Southern Oscillation
FAO	Food and Agriculture Organization
GHGs	Greenhouse Gas Emissions
IEA	International Energy Agency
ICCI	International Cryosphere Climate Initiative
ICCIC	Israeli Climate Change Information Center
ICT	Information and Communications Technology
IDF	Israel Defense Forces
IDMC	Internal Displacement Monitoring Center
IFP-EW	Initiative for Peacebuilding – Early Warning Analysis to Action
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
IISD	International Institution for Sustainable Development
J.O.E	Joint Operating Environment
MEMAs	Middle Eastern-Mediterranean Alliances
MFA	Israel Ministry of Foreign Affairs
MoEP	Ministry of Environmental Protection
MRF	Mary Robinson Foundation
MRV	Measurement, Reporting and Verification
NASA	National Aeronautics and Space Administration
NII	National Insurance Institute of Israel
OECD	Organization for Economic Cooperation and Development
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly
UNHCR	United Nations High Commission for Refugees
U.S. DoD	United States Department of Defense
WFP	World Food Programme
WGBU	German Advisory Council on Global Change
WHO	World Health Organization
WMO	World Meteorological Organization

Abstract

The paper aims to provide a base for future assessments of "Climate Change and Security" in Israel and the Middle East. The linkages between climate change and National security are discussed vis-à-vis the current geopolitical landscape and associated transboundary challenges. Current climate-security challenges include migratory pressures, climate refugees, water stress and food insecurity. The study employs the Intergovernmental Panel on Climate Change (IPCC) framework of "Climate Mitigation and Adaptation" to assess prospects for climate-security in the region. Preliminary findings correlate Israel's potential role in climate-security politics to positive economic benefits. Climate Change Leadership (CCL) offers an alternative pathway for regional cooperation and geopolitical stability through the promotion of Middle Eastern-Mediterranean Alliances (MEMA's). Foremost this vision aligns to a core strategic national masterplan – ***Leveraging for Geopolitical Cooperation and Regional Transformation*** *– designed to strengthen Israel's commitment towards a Climate Compatible Future (CCF). To help achieve this future, the final chapter suggests policy recommendations to promote geopolitical cooperation and regional transformation in response to the socio-economic and environmental pressures of anthropogenic climate change.*

Introduction

Through a historical lens, the opening chapter presents the security prism in its broadest scope by revealing "The Power of Climate Change." Given its far-reaching parameters, climate change acts as one of the main drivers of change across societies and civilization. From the complex and interconnected contours of climate change, also emanate a wide-range of security risks. International perspectives reinforce a "Continuum of Concern" in purview of recent policy developments, including the findings of the Intergovernmental Panel on Climate change (IPCC); the United Nations Framework Convention on Climate Change (UNFCCC); the International Energy Agency (IEA); and the European Environment Agency (EEA), in addition to other organizations/actors. The chapter concludes with a summary of the main concerns concurrent to the climate change literature and discourse, accounting for threats to human and social security.

Chapter 2 turns attention to "Regional Perspectives of Climate Change," which include "early warning signs" from identified climate security threats in the Middle East and North Africa. In relation to the surrounding geopolitical landscape and associated transboundary challenges, climate predictions exert tremendous pressures. Security threats are both socio-economic and environmental in nature, including "Migratory Pressures and Climate Refugees" and "Transboundary Water Stress and Food Insecurity." Given the matrix of Israel's ongoing "Security Stance" and current "Policymaking Principles," climate change presents a threat to Israel's National Security (Chapter 3). This security threat connects to "Israel's Carbon Footprint and the Politics behind the Paris Agreement," which continue to highlight an underlying absence of climate change mitigation and adaptation, as reflected by Israel's failure to meet its Intended Nationally Determined Contribution (INDC) set at COP21[1] in Paris.

In response to the current state of affairs, the implications for policymakers are substantial. Security analysts should also begin to incorporate the serious geopolitical consequences of climate change into decision-making processes. Within a new environment committed to a Climate Compatible Future (CCF) lies the potential for a shift from political

[1] 21st Conference of the Parties (See Section 3.1:" Israel's Carbon Footprint and the Politics behind the Paris Agreement.")

stagnation to technological innovation, as Israel comes to realize the significance of climate-security leadership. In order to strengthen Israel's National Security and work towards regional stability, security strategies and policy measures must calibrate to a new vision of "Geopolitical Cooperation and Regional Transformation," through which mutually beneficial alliances can evolve. By adopting "A New Governance Toolkit" that fully identifies the climate-security nexus, Israel can implement effective policy measures to stem the tide of anthropogenic climate change.

Background

Climate change may be one of the most important issues facing human civilization, or perhaps even life on earth, yet a status quo of inaction and delay continues to ring true for many governments across the world (Gartzke 2012; Furman et al. 2015). Rigorous multidisciplinary research examining quantitative data displays a strong correlation between past climatic events and human conflict, which "appears to extend across the world, throughout history, and at all scales of social organization" (Hsiang et al. 2013). The links between dramatic global and regional impacts have been widely documented:

> Climate change will increasingly be a wide-ranging river of global security. It will act as a threat-multiplier, exacerbating weakness and tensions around the world. It can be expected to worsen poverty, have a significant impact on global migration patterns, and risk tipping fragile states into instability, conflict and state failure (UK Cabinet Office 2008).

Despite these warnings and risks, global policymakers have remained primarily passive. This attitude has served to deepen the prospective longevity of harmful anthropogenic impacts, originating from humankind's extensive carbon footprint (Padgett et al. 2008).

Scientific data indicates "The relentless rise of carbon dioxide" and confirms that the current rate of climate change is unprecedented in human history (Fabry 2015):

Anthropogenic activities are contributing increased heat to the climate system. Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia (IPPC 2014).

The inherent inertia of earth's climate system guarantees that a certain degree of climate change is already "locked-in" – even if levels of greenhouse gas emissions (GHGs) were curbed significantly – many aspects of climate change and its associated effects will continue for centuries (IPCC 2001; IPCC 2014). It is widely acknowledged by the scientific community that the probability of abrupt consequences from the triggering of "tipping elements" in the climate system is increasing (Lenton et al. 2008). Within this century, a variety of tipping elements could reach their critical point in response to anthropogenic climate change (See annex 1). By

the same token, the archaeological record points to the degree to which climatic variations have triggered large-scale disruptions in the past (Adger & Brooks 2003). Such events likely contributed to the collapse of earlier civilizations and heavily influenced human migration patterns (See Haug et al. 2003, Binford et al. 1997, Cullen et al. 2000).

The security risks arising from climate change underline the need for political leadership and economic planning committed towards "keeping carbon dioxide and other greenhouse gas levels within a range that will not lead to the biosphere changing states drastically to one that may be much less conducive to human life" (Dalby 2014). To date there is no "silver bullet" for human-induced climate change[2] in the age of the Anthropocene[3] (Pinder 2014; Lempert 2015; Cho 2016).

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[2] http://www.seccca.org.au/human-induced-climate-change/

[3] Earth scientists suggest that we now live in a new era of natural history, the Anthropocene; one marked by the emergence of a new series of geological, biological and climatological forcing mechanisms in the biosphere (Zalasiewicz et al. 2010).

Chapter 1: Climate Change through the Security Prism

1.1. The Power of Climate Change

The contours of climate change are broad and complex. The IPCC's Fourth Assessment Report states: "Climate change impacts will spread from directly impacted areas and sectors to other areas and sectors through extensive and complex linkages" (Parry et al. 2007). Climatic variables act as a "macro-driver" for a wide range of environmental parameters, which is typified by overall increases in the intensity (and in some cases frequency) of droughts, fires, heat waves, storms, floods and epidemics (Barnett & Adger 2007). Hurricane Katrina (2005) exemplifies the early climate trends of this century; it killed more than 1,800 people and dislocated another 270,000, caused eight billion dollars in damages, and took offline critical energy infrastructures (Busby 2016). More recently, Superstorm Sandy (2012) left 8.5 million people without power and caused several billion dollars' worth of damage in its wake (Busby 2016).

Climate change is reallocating the global distribution of precipitation, thereby shifting rainfall patterns within and across continents (Dore 2005). Soil erosion by wind and water is increasing, in turn reducing soil moisture, while the rate of coastal erosion has also increased with global warming trends (Brevik 2013; Roux et al. 2013; Zhang et al. 2004). On land much of the available heat goes into drying, therefore, droughts may be more extensive in the future; a natural drought should set in quicker, become more intense, and may last longer (Trenberth 2014). Although extensive, the numerous dangers already observed and documented are just the tip of the iceberg. Countries must also contend with the unknown risks that may emerge via high-impact climatic events. Due to unquantifiable uncertainties, science still cannot deliver a full distribution of outcomes when dealing with climate change projections and impacts (Dessai and Hulme 2004).

Climate-associated impacts are inherently non-linear; therefore, positive feedback loops in the climate system could lead to a series of uncontrollable cascading effects (Schneider 2003; Le Page 2010). The melting of glaciers and permafrost could increase global sea levels by several meters, while the collapse of the North Atlantic thermohaline circulation (THC) could

fuel a new scale of climate "shocks" and "surprises"[4] (ICCI 2017; Vellinga 2002). Large-scale shifts in the Asian monsoon patterns and the El Niño Southern Oscillation (ENSO) phenomenon also appear to be on the horizon (Loo et al. 2015). Combining several of these changes (the melting of the polar ice sheets, shutdown of the thermohaline circulation, weakening of monsoon patterns etc.) might trigger a "cascade of destabilizing events" (Karas 2003; See Annex 1).

1.2. International Perspectives: A Continuum of concern

In 1988, the World Meteorological Organization (WMO)[5] and the United Nations Environment Programme (UNEP)[6] set-up the Intergovernmental Panel on Climate Change (IPCC): "To provide policymakers with regular assessments of the scientific basis of climate change, its impacts and future risks, and options for mitigation and adaptation" (IPCC 2013). Mitigation principally refers to emissions reduction, while adaptation takes place through "adjustments to reduce vulnerability or enhance resilience to observed or expected changes in climate, which involves changes in processes, perceptions, practices, and functions" (Brown et al. 2007). According to UNEP, mitigation includes "using new technologies and renewable energies, making older equipment more energy efficient, or changing management practices or consumer behavior" (UNEP 2017).

Since the IPCC's inauguration and the subsequent call for mitigation and adaptation, other organizations have followed suit such as the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC established its agenda according to Article 2:

The ultimate objective of this Convention…is to achieve…stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system (UNFCCC 1992). Article 2 also established the notion of "common but different responsibilities" when it comes to tackling climate change. The IPCC is currently in its Sixth Assessment cycle, which will produce its Sixth Assessment Report (AR6),

[4] These include "unexpected and potentially disruptive single events as well as conjunctions of events occurring simultaneously or in sequence" (National Research Council 2013).
[5] https://www.wmo.int/pages/index_en.html
[6] http://www.unep.org/

while the UNFCCC directed the Paris Climate Agreement during 2015-2016, to which 194 Parties signed and 137 have ratified (IPCC 2017; UNFCCC 2017). Through the IPCC, the UNFCCC or similar institutions, the framing of climate and society relations strongly influences "the way their coevolution is interpreted and responded to" in the socio-political sphere (Hulme 2009).

In 2003, a full decade prior to the release of the IPCC's Fifth Assessment Report (AR5),[7] one of its contributing authors hypothesized that, "[both] in less direct ways, but also through direct processes such as territorial losses through rising sea levels, climate change may be a national security issue" (Barnett 2003). The widespread ramifications of climate change are concurrent to the security discourse, whereby climate change could constitute a direct national security threat to a country's homeland, or equally threaten its overseas or international interests (Busby 2008). Climate change is essentially a global threat that extends beyond borders, ideologies and cultures (Brown & Crawford 2009). On the other end of the spectrum, climate protection is arguably a "global public good" (Grasso 2004).

The security nexus is complex and dynamic, with past processes such as colonization and war influencing present insecurities (Barnett & Adger 2007). At the same time, "ongoing processes such as climate change and trade liberalization shape future insecurities," which can widen the generative parameters tied to conflict origins (Barnett 2003). Since the early 2000s, the climate-security nexus has gained momentum and validity. Several reports have emphasized the need to view climate change through a security lens, since "…without resolute counteraction, climate change will outstretch many societies' adaptive capacities within the coming decades, which could result in destabilization and violence, jeopardizing national and international security to a new degree" (Klein & Huq 2003; WBGU 2007).

The reclassification of climate change into a "global threat to stability and security"[8] emerged in earnest during 2007, when the Center for Naval Analyses (CNA Corporation)[9] characterized climate change as a "potential threat multiplier for instability in some of the most volatile regions in the world, presenting significant national security challenges for the United

[7] https://www.ipcc.ch/report/ar5/
[8] https://www.adelphi.de/en/news/climate-change-global-threat-stability-and-security
[9] https://www.cna.org/

States" (Board MA 2007). In 2007, the German Advisory Council on Global Change (WGBU)[10] forecasted "climate change to draw ever-deeper lines of division and conflict in international relations:"

> Triggering numerous conflicts between and within countries over the distribution of resources, especially water and land, over the management of migration, or over compensation payments (WBGU 2007).

The UNFCCC's 2007 charter likewise informed policymakers to take measures to avoid "dangerous" interference in the climate system, since such impacts constitute a "threat to security" (Barnett 2003). The following year saw the European Commission affirm these sentiments to establish a sense of US and EU consensus on the threat level: "Climate change is best viewed as a threat multiplier which exacerbates existing trends, tensions and instability" (Solana et al. 2008).

Great Britain and Germany represent two of strongest proponents of climate change policy. In 2008, the United Kingdom Cabinet Office presented its National Security Strategy report, which underlined climate change as potentially the "greatest challenge" to global stability and security, and therefore to national security:

> Tackling its causes, mitigating its risks, and preparing for, and dealing with its consequences are critical to our future security, as well as protecting global prosperity and avoiding humanitarian disaster (UK Cabinet Office 2008).

Together British and German politicians[11] have led the subsequent call for political engagement with similarly decisive remarks: "Climate change will reshape the geopolitics of the world in which we live, with important consequences for peace and security" (Diez et al. 2016). By 2012, the then UK coalition government[12] had further intensified this view, referring to climate change as "…both a creator of new threats and a 'threat multiplier,' magnifying existing weaknesses and tensions around the world" (Harris 2012). This concrete statement followed

[10] WGBU is branch of the European Environment Agency (EEA). http://www.wbgu.de/en/press/press-releases/2007-12-15-press-release/

[11] David Miliband (British Labour Party politician) and Frank-Walter Steimeier (German Foreign Minister). http://www.politico.eu/article/miliband-time-to-put-planet-first-on-climate-change/

[12] https://www.gov.uk/government/policies/climate-change-international-action

the publication of an influential government report reconceptualizing the meaning of national security in the 21st century:

> Our security is vulnerable to the effects of climate change […] So the concept of national security in 2010 is very different or what it was ten or twenty, let alone fifty or a hundred years ago (UK Cabinet Office 2010).[13]

Across the Atlantic, the Joint Operating Environment similarly listed climate change as one of the main security threats facing the military in the next 25 years (J.O.E 2010). More recently, in the *Briefing Book for a New Administration* (2016), the Climate and Security Advisory Group (CSAG) warned: "Climate change can be a driver of instability and the Department of Defense must pay attention to potential adverse impacts generated by this phenomenon (CSAG 2016). At the start of 2017, U.S. Secretary of Defense James Mattis emphatically highlighted the climate-security nexus before the Senate Armed Services Committee:[14]

> Climate change is a challenge that requires a broader, whole-of government response… I will ensure that the Department of Defense plays its appropriate role within such a response by addressing national security aspects (Mattis 2017).

He also stressed the need for divestment from fossil fuels by advocating renewable and clean energies, as part of the newfound drive towards security and stability (Burke 2016).

Mattis has long viewed climate change as a threat to U.S. security operations and national security, as well as global stability in general (Revkin 2017):[15]

> Climate change is impacting stability in areas of the world where our troops are operating today… It is appropriate for the Combatant Commands to incorporate drivers of instability that impact the security environment in their areas into their planning (Werrell and Femia (2017).

While Mattis's stance on climate change has received much praise from U.S. military leaders, President Donald Trump has opted to disengage from climate-security diplomacy by

[13] https://www.gov.uk/government/policies/climate-change-international-action
[14] https://www.armed-services.senate.gov/
[15] https://climateandsecurity.org/2017/03/16/release-u-s-military-leaders-applaud-secretary-mattis-clear-eyed-view-on-climate-change-and-security/

announcing that the United Stated will exit the Paris Agreement.[16] Despite President Trump's emphatic move to distance the United States from the international climate policy arena, other world leaders increasingly recognize that climate change produces a continuum of concern that is only set to proliferate with time. Irrespective of the ill-timed motion of President Trump, the record books illustrate that the international community is still yet to unite in decisive action on the climate change front.

1.3. Conflict constellations and Security stressors

In 2007, WGBU identified four specific "conflict constellations" related to climate change – "Water stress, food insecurity, natural disasters and migration" (WGBU 2007). Water resources encompass the basic fabric of survival and the functioning of society:

> Water stress revolves around the complex causal relationship between hydro-climatology and water-related political relations, which depends on socio-economic conditions and institutional capacity, as well as the timing and occurrence of changes and extremes in a country and a basin (Scheffran & Battaglini 2011).

The relationship between water, energy, agriculture and climate is increasingly falling out of balance, in turn jeopardizing food, water and energy security.[17]

According to experts, climate change "claws"[18] at the four pillars of food security[19] (Nelson et al. 2010; Wheeler & Von Braun 2013). The United Nations Emergency Relief Coordinator, Stephen O'Brien, has cautioned the UN Security Council of the imminent risk of famine in Yemen, Somalia and South Sudan, since climate change is set to increase the vulnerability of global food systems and regional supply chains (O'Brien 2017; Wheeler & Braun 2013). When it comes to food security, "climate surprises" could further destabilize vulnerable regions and disrupt globally integrated systems, such as grain markets (WFP 2017; National Research Council 2013). The Food and Agriculture Organization (FAO) conclude that climate

[16] https://www.whitehouse.gov/the-press-office/2017/06/01/statement-president-trump-paris-climate-accord
[17] http://www.gracelinks.org/2380/the-impact-of-climate-change-on-water-resources
[18] https://gnightearth.com/2013/09/08/how-climate-change-claws-at-the-four-pillars-of-food-security/
[19] The four dimensions of food security include availability to food, accessibility (economically and physically), utilization (the way it is used and assimilated by the human body) and stability of these three dimensions (Bisas 1996): http://www.fao.org/3/a-i5188e.pdf

change has impacted and will increasingly affect social security and health – via physical impacts on ecosystems, agro-ecosystems, agricultural production, food chains, incomes and trade – which together determine levels of economic and social impact on livelihoods, food security and nutrition (FAO 2016).

The motivations for migration can be multiple, and it remains a challenge to differentiate between "economic pulls and environmental pushes" (Reuveny 2007). Nevertheless, there is increasing evidence that migration is a possible response not only to poverty and social deprivation, but also to environmental hardship (Scheffran 2010). Since 2008, an average of nearly 27 million people has been displaced annually by "natural hazard-related disasters" – one of WGBU's identified "conflict constellations" (IDM Center 2014). In his 2006 study, *Refugees, Climate Change, and Instability*, Idean Salehyan concludes that "environmental stress can lead to migration itself, or it can lead to refugee-producing civil unrest" (Salehyan 2005). Similarly, the WGBU predicts that an increase in "forced migration" by climate change would create more "migration hotpots" around the world, each becoming a potential "nucleus" for social unrest (WGBU 2007). In effect, "migration may constitute the most critical societal response to climatic perturbations" (Feitelson and Tubi 2017).

Analysts argue that climate change migrants and refugees can destabilize aspects of resource distribution such as farmland, housing, water, employment, and basic social services by increasing competition (Carius 2006). Migration waves may provoke outbreaks of conflict in transit and target areas and in some cases environmental migrants are perceived to upset the "ethnic balance" in a region (Scheffran and Battaglini 2011; Reuveny 2007). Furthermore, refugees originating from conflict zones or "environmentally-induced" civil wars link to a higher propensity for engagement in organized violence and cross-border attacks against their home government (Salehyan 2005). Overall, migratory pressures may jeopardize the safety of local populations, while adding to the burden of national security.

In 2013, the National Academy of Sciences reported that climate change is likely to produce consequences beyond "the capacity of the affected societies or global systems to manage and have global security implications serious enough to compel international response" (National Research Council 2013). Within this context, Darfur represents a "tragic

example of the social breakdown that can result from ecological collapse"[20] (Mazo 2009; UNEP 2007). Environmental stress is strongly linked to "increased severity, duration and collateral damage" in relation to outbreaks of conflict, although these factors are more of a stimulus than facilitator (Brown & Crawford 2009). While climate change is by no means the sole cause of conflict clusters and security threats, it contributes to the mix of "existing socioeconomic and environmental vulnerabilities that can lead to a humanitarian crisis" (Das 2016).

Given the synergistic nature of climate effects such as water scarcity, food insecurity and migratory pressures, these factors may stand to pierce the very pillars of economic stability and the fabric of national security. The nexus between climate change and security stems from the interactions between prolonged droughts, crop failures, disintegration of agricultural livelihoods, rural dislocation, migration to cities and a weakening social fabric brought about by the perpetuation of disenfranchised sectors of the population.

1.4. Human and Social Security under Climate Change

Human security[21] functions through "multiple processes operating across space, over time, and at multiple scales (Barnett & Adger 2007). It refers to the condition in which people and communities have the necessary capacity to navigate stresses, which may affect their needs, rights, and values, thus "shielding people form critical and pervasive threats and empowering them to take charge of their lives" (Alkire 2003; Ogata et al. 2003). Recent years have seen climate change repeatedly characterized as a "conflict accelerant" or "threat multiplier," which jeopardizes human security and poses a substantial risk to stability and sustainability in years to come (IPCC 2007).

The IPCC's Fifth Assessment Report marks the first instance of integrating the human security dimensions of climate change into a formal chapter (Gleditsch et al. 2014). The report extends the traditional framework of security by incorporating economic, cultural, livelihood and migratory dimensions into the climate change discussion (Adger et al. 2014). Climate

[20] Regional experts acknowledge the environmental contribution to the conflict, but also warning of "the danger of oversimplifying Darfur" (Butler 2007).

[21] http://www.un.org/humansecurity/sites/www.un.org.humansecurity/files/human_security_in_theory_and_practice_english.pdf

change signifies a developing cause of "livelihood contraction," on the basis that it will continue to contract the livelihoods of many people, by way of land losses and declining returns from human used land (Barnett & Adger 2007). Livelihood security connects to personal security and security from violence, which together form the basis for a functioning system of society. Under pressures from scarce resources and limited wellbeing, there is an increased propensity for people to engage in violence as an "alternative livelihood strategy" (Young & Goldman 2015).

Concomitantly, climate change develops as a threat to human security[22] that may heighten the risk of violent conflict, especially in regions prone to instability and already susceptible to outbreaks of war. The IPCC views conflict as exacerbated by specific stress factors:

> Vulnerable regions face multiple stresses that affect their exposure and sensitivity as well as their capacity to adapt. These stresses arise from, for example, current climate hazards, poverty and unequal access to resources, food insecurity, trends in economic globalization, conflict, and incidence of diseases such as HIV/AIDS (IPPC 2007).

Violent conflict shares links to human insecurity, and vice-versa, while vulnerability to climate change also fits into the insecurity mix (Barnett 2006). As the 2006 Stern Review attested, "Climate-related shocks have sparked violent conflict in the past," and conflict presents a serious risk to areas such as Central Asia, West Africa, the Nile Basin, and by proxy the Middle East (Stern 2006). Given the wrong set of conditions, the associated socio-economic and political stress of climate change can erode the functioning of communities, the effectiveness of institutions and the stability of societal infrastructures (Barnett & Adger 2007).

Through a meta-analysis examining populations in the post 1950s era, Hsiang et al. substantiate that large deviations from normal precipitation and mild temperatures systematically increase the risk of many types of conflict, often substantially, and that this relationship appears to hold over a variety of temporal and spatial scales (Hsiang et al. 2013). The authors conclude that climatic changes influence conflict through multiple pathways that

[22] Human security depends on a system where each rational individual calculates that it is more profitable not to rebel (Gough 2002).

may differ between contexts; therefore, innovative research to recognize these mechanisms needs to become a "top research priority" (Hsiang et al. 2013). Security analysts in the United States echo this viewpoint through their shared agenda; attempting to synthesize the current state of knowledge and the geopolitical atmosphere in order to account for the geostrategic implications of the political environment, as "climate change policy becomes an increasingly top tier issue in international relations" (Busby 2016).

The IPCC's 2007 Report notes that poor communities are often limited in their adaptive capacities, with heavy dependency on climate-sensitive resources such as local water and food supplies (Parry et al. 2007). Social conflicts at all scales and levels appear susceptible to the impact of climate change, and multiple dimensions of the climate system have the capacity to influence a range of outcomes (Hsiang et al. 2013). Social cohesion is one determinant of resilience, while several factors determine "entitlements" to economic and social capital, which in turn govern the capacity for society to adapt to climate change (Barnett & Adger 2007). The "architecture" behind entitlements is temporally and spatially complex due a multitude of factors, such as distant atmospheric polluters, regional-scale climatic processes and the dichotomy between up-steam and down-stream water networks (Adger & Kelly 1999).

The consequences of climate change reflect the economic, human and social capital of a nation; shaped by access to resources, information and technology, social cohesion, and the ability and effectiveness of institutions (Barnett & Adger 2007). Climate change impacts present chronic and episodic challenges to state capacity and to the fundamental welfare of populations, at a scale that raises questions of state stability. In turn, the resilience of security units and social institutions plays a key part in offsetting the effects of national dependence on "climate sensitive natural resources" and in curtailing extant bioregional and geopolitical vulnerabilities (Barnett & Adger 2007).

In response to recognized conflict pressures, the United Nations General Assembly 2009 report identified a series of "conflict minimizers" – Climate mitigation and adaptation, economic development, democratic governance and strong local and national institutions, cooperation, preventive diplomacy and mediation (UNGA 2009). When a government and its policy measures function constructively across society and respective sectors (energy,

environment etc.), there is a greater likelihood of meeting the following "strong state" criteria (Kahl 2006):

> Effective administrative hierarchies, control of the legitimate use of force, ability to mediate impending conflicts before they turn violent, and more capability to manage environmental degradation and change (See Hauge et al. 2001; Esty 1999; Rose 1976).

Consequently, in a state aligned to strong liberal-democratic values, "both the structural conditions and livelihood factors that increase the risk of violent conflict are reduced" (Barnett & Adger 2007).

The act of reducing anthropogenic greenhouse gas emissions is akin to "a social and technological problem with social and technological solutions" (Gillard 2016). Localized scarcity may generate political tensions, but it can also yield technological or social innovation that may manage any tendency toward conflict and alleviate pressures placed upon human security (Gartzke 2012). Climate security derives its effectiveness from connective capacity, regional interlinks, presence on the ground and anticipatory capabilities. In response to the exacerbation of climate change and the unpredictability of weather patterns, practical infrastructure provision and improvements in adaptive capacity can strengthen human security.

Chapter 2: Regional Perspectives of Climate Change

2.1. Climate predictions and Environmental pressures

Israel faces distinct pressures from climatic effects projected to affect the Mediterranean Basin and the Middle East. In the last few decades, anthropogenic climate change has significantly impacted the Middle East: Since 1950 there has been an increase in aggregate temperatures, a decrease in the number of cold days, and an increase in the amount of warm days (Zhang et al. 2005). In the future, the southern part of the eastern Mediterranean and the Middle East may be exposed to 2–3 months more combined tropical nights and hot days, while the northern part could experience increased heat wave amplitudes ranging from 6-10 degrees Celsius (Zittis et al. 2016).

Regional climate change models for the Eastern Mediterranean also predict a further increase in the frequency and duration of severe droughts. The observed wintertime Mediterranean drying over the last century corresponds to "the region's sensitivity to a uniform global ocean warming and to modest changes in the ocean's zonal and meridional sea surface temperature (SST) gradients" (Weinthal et al. 2015; Hoerling et al. 2012). Consequently, the IPCC has identified the Mediterranean region as a climate change "hot spot," with most countries of the Eastern Mediterranean already experiencing temperature rises; accompanied by growing rates of desertification, increases in freshwater scarcity, forest fires, and increasing drought frequency (Solomon 2007; Loizidou et al. 2016; Hoerling et al. 2012).

Based on IPCC models, the warming trends of recent years are set to continue. Average temperatures in Israel are set to rise a further 1.5 ^{o}C within the next few years; reaching 5^{o}C towards the end of the century compared to 1960-1990 levels (MoEP 2010). The largest form of climate change, however, corresponds to a decrease in precipitation in the Eastern Mediterranean and the Middle East caused by a decrease in storm track activity over the Eastern Mediterranean (Evans 2009). While precipitation is predicted to decrease by 20% by 2050, sea level rise in the Mediterranean is estimated to hit one meter by 2100, following 0.5 meters by 2050 (Evans 2009; MoEP 2010).

Reports from the Israeli Climate Change Information Center[23] indicate that rising sea levels could lead to flooding in Tel Aviv as far east as Ibn Gvirol Street (ICCIC 2012). Similarly, the frequency and length of extreme weather events, such as exceedingly wet or dry years has increased and related events like droughts, heat waves and floods are likely to escalate (Brown & Crawford 2009). Between the years of 2003/2004 to 2010/2011, Israel suffered 7 years of consecutive drought, surviving "the Mediterranean's worst drought in 900 years," which was consistent with global trends that have seen the ten warmest years on record all occur since the year 2000 (OECD 2011; Sharon 2016; NASA 2015). Natural climatic variability cannot account for the increasing frequency of wintertime droughts in the Mediterranean[24] (Hoerling et al. 2012).

In terms of regional hydrology, the combination of higher temperatures and lower levels of precipitation will reduce the flow of rivers and streams. In the Middle East, climate change will bring a stream of negative consequences, especially for agriculture, river flows and the rate at which groundwater aquifers replenish (Brown & Crawford 2009). Furthermore, increased rainstorms, erosion and runoff will affect the natural rates at which aquifers recharge, adding further water stress to the region. Israel's National Report under the UNFCCC warned that water supply may severely decrease, falling by 60% of 2000 levels by 2100, which has been reinforced by the Ministry of Environment in subsequent reports (Pe'er & Safriel 2000; Gabbay 2001).

The Middle East's transboundary rivers provide about 60 % of its freshwater supplies, which the World Bank reports as the highest rate of dependence on international basins in the world (Hamdy 2005). To make matters worse, these transboundary rivers have asymmetrical upstream and downstream power relations, which further complicate access to and control over water resources (Lowi 1993). Under conditions of moderate temperature increase, the Euphrates River would carry 30% less water than at present and the end of the century could see the Jordan River shrinking by up to 80% (Brown & Crawford 2009). Additional impacts, such

[23] http://www.sviva.gov.il/English/env_topics/climatechange/Adaptation/Pages/ClimateChangeInformationCenter.aspx

[24] Within the past 20 years, the region experienced 10 of its 12 driest winters since 1902 (Hoerling et al. 2012).

as reduced flows to Lake Kinneret and reduced recharge of groundwater aquifers, are likely to problematize the colossal effects of climate change in Israel and the Middle East (OECD 2013).

In sum, climate change is highly likely to influence Israel's water resources, while agriculture, biodiversity and public health are extremely vulnerable to changes in climatic conditions (ICCIC 2011). Due to the unequal distribution and scarcity of water in the Middle East, there is an underlying reason for its classification as a long-term security concern linked to climate change. Strategic policy needs to anticipate the widespread and interconnected impacts of climate change, including the threat of multi-decadal megadrought. As illustrated, these impacts are already visible today and will further intensify in the days to come, with probable damages more severe in the Middle East than in other regions of the world. Policy measures necessitate formulation and implementation sooner rather than later.

2.2. Regional Security Threats: Early Warning Signs

The Middle East qualifies as a probable climate change conflict-zone. In part, this prognosis is due to its history of conflict and existing water stress (Bromberg 2009). Water resources have long represented an "additional dimension" connected to the fate of the Middle East Peace Process (Scheffran & Battaglini 2011; MFA 2017). In a region already considered the world's most water scarce, climate models are predicting a hotter, drier and less predictable climate (Mrasek 2008).

In the international discourse, climate change exhibits familiar characteristics, as "an amplifier of existing social, economic and ecological problematics" (Gillard 2016):

> Exacerbating threats caused by persistent poverty, weak institutions in resource management and conflict resolution, fault lines and a history of mistrust between communities and nations and inadequate access to information and resources (UNGA 2009).

In the Middle East, such fault lines remain precarious under a geopolitical landscape sensitive to environmental challenges. According to the International Institution for Sustainable Development (IISD), this mix "impedes greater efficiency, undermines innovative solutions to regional problems and fosters a zero-sum approach to sharing scarce resources" (Brown &

Crawford 2009). The legacy of conflict in the Middle East, coupled to the lack of cooperation and underlying distrust between nations and common internal conflicts, multiplies the challenges of climate change considerably. Security is a constant concern in the Middle East, as evidenced by ongoing events in Syria (Security Council Report 2017; See Annex 1b). Given this atmosphere, it is probable that several dimensions of climate change will strongly influence future progress and development in the region.

The pervasive risk factors associated to climate change are liable to interact hazardously with the ecological and social systems of Israel, and the Middle East at large (Aytzim 2017). While Israel's geopolitical entanglement is distinctive, Israel's ecology and climate are among the most fragile on the planet (Alterman 2015). In the absence of staging substantial policy intervention – *ceteris paribus* – the country could be set to face insurmountable levels of destabilization. Risk factors orientate around the sensitivity of resources like freshwater, reefs, fisheries and soils to heightened climate variance, which in turn affects the extent to which people rely upon natural resources to meet their daily needs (Wentz 2016). The impact of this relationship influences the responsive capacity of social systems, as individuals adapt to resource fluctuations (IPCC 2017).

The challenges ahead are potentially overwhelming, and include "disruption of agriculture, low lying areas flooded by rising seas, higher risk of conflict over resources, increased refuge flows (both in the Levant and in Egypt,) and all the security threats that follow (Brown & Crawford). Once the adverse impacts of climate change coalesce with existing divisions within Israeli society and the Middle East at large, there is increased likelihood for security disruptions and livelihood contractions, in addition to further geopolitical instability.

Over time and across biomes, climate change increases the propensity for severe, pervasive and irreversible impacts for populations and ecosystems. Global warming threatens the long-term conditions for cooperative solutions in the Middle East. Warming is set to increase the likelihood and intensity of droughts in the region, in turn reducing the conditions to facilitate peace and security. Climate change looms large over the Middle East and threatens to "redraw the maps of water availability, food security, disease prevalence, population

distribution and coastal boundaries," which will compound the already extensive security challenges facing the region (IPCC 2007; Brown & Crawford).

2.3. Migratory Pressures and Climate Refugees

Since 2010 the impacts of climate change on external migration to Israel has touched the outskirts of national security discussions. The Israeli Climate Change Information Center (ICCIC) explicitly link climate change to the threat of "climate refugees" from Sub-Saharan Africa (ICCIC 2012; Weinthal et al. 2015; See Annex 1b). Such conclusions stem from the recent surge in African migrants and asylum seeks, with 60,000 refugees having crossed into Israel by way of Egypt since 2005 (Human Rights Watch 2014).[25] Drought and desertification across much of the Sahel have undermined agricultural and pastoral livelihoods, adding further pressures to well-established migratory routes between Libya, Nigeria, Niger, Burkina Faso and Mali to the Mediterranean coast, Europe and Israel. (Heinrigs 2010; Werz & Conley 2012; Femia & Werrell 2013).

In the Middle East, the most recent influx of refugees has originated from the ongoing conflict in Syria, with the United Nations High Commissioner on Refugees (UNHCR) listing 620,441 registered Syrian refugees in Jordan alone (WHO 2014; See Annex 1). Additionally, large numbers of undocumented refugees from Libya and Yemen also reside in Jordan, adding to the costs of housing and public services, while placing further stress on local resources, which together heightens the level of domestic social conflict (Weinthal et al. 2015; Fagen 2009). According to the UNHCR,[26] migratory pressures and "the adverse effects that climate change may have on natural resources, may spark conflict with other communities, as an increasing number of people compete for a decreasing amount of resources" (UNHCR 2015).

The ICCIC recommends "Israel to take steps to insulate itself from instability, such as strengthening its border barriers and defenses," in tandem to the proposed building of "sea fences" along the Mediterranean and Red Seas, with added law enforcement along border zones (ICCIC 2013; Udasin 2012; Udasin 2014). These measures can enhance Israel's geopolitical

[25] https://www.hrw.org/world-report/2014
[26] http://www.unhcr.org/pages/49e4a5096.html

and economic security, as witnessed through the construction of a border fence across the Israel-Egyptian border that has effectively closed the migratory routes taken by African refugees to enter Israel (Fiske 2013). At the same time, however, the root causes of migration and their interconnections to climate change must go beyond the conventional security agenda and analysis. In this light, *The Paths to Sustainability* coalition in Israel encourages increased efforts for regional collaboration in the advancement of agricultural efficiency and water management (Milrad-Givon 2012).

2.4. Water Stress and Food Insecurity

Water resources have long formed a strategic issue in the Middle East due to the transboundary nature of water supplies, often leading to disagreements that coincide with land disputes (Scheffran & Battaglini 2011). Across the Middle East, water scarcity poses a "perennial threat" to socio-economic security – home to more than 7% of the world's population; the region is endowed with little more than 1% of the world's renewable freshwater supply (Michel & Yacoubian 2013). Disproportionate distribution of water resources, whether naturally occurring or artificially induced, or a combination thereof, is intrinsically linked to food insecurity.

For decades Israel's water management strategy in relation to its domestic and regional contours has been framed as a "national security issue" Weinthal et al. 2011). In contrast, the securitization of migration is a relatively recent phenomenon, while climate-security is still in its infancy. One of the most contentious areas has been the sharing of the Jordan River basin among Israel, Jordan, Lebanon, Syria and the Palestinians, raising issues of equity (Phillips et al. 2007). In essence, the region's conflicts orientate around largely political differences, in which water-related problems add an additional dimension to interactions, which may yield cooperative pathways or further drive conflict (Shuval et al. 2007).

Water resources link fundamentally to peace efforts in the Middle East. Climate change surfaces above all environmental and resource-based factors, thus making it a principle determinant of stability in the region. At the same time, the future long-term conditions for cooperative progress in the Middle East may also decline due to "population growth,

overexploitation and pollution" (IPCC 2007). The Middle East is the world's youngest region with its demographic trends being both a cause and a consequence of rapid population growth (Dhillon & Fahmy 2008; Constant & Kraetsch 2010). Given this added level of pressure to resources, climate change is likely to hinder the negotiation of transboundary issues and may obstruct the mediation of peace agreements in the region.

Following the global food crisis of 2007-2008, basic food prices in many countries across the Middle East skyrocketed. These developments caused public budgets to plunge into deficit, adding fire to the fuel of popular discontent that culminated in the Arab Spring (Breisinger et al. 2012). Since late 2010, 16 of the 22 countries in the Arab world have experienced some form of popular rest (Michel & Yacoubian 2012). It is widely agreed that spikes in global food prices are a "proximate factor" behind recent escalations in the Middle East, which are tied to extreme global weather events (Johnstone & Mazo 2011). By 2011, the Global Assessment Report estimated that 1 million Syrians had been left extremely "food insecure" by the droughts in the region; the worst drought in the instrumental record which resulted in widespread crop failure and a mass migration of farming families to urban centers (Erian et al 2011; Femia & Werrell 2013; Kelley et al. 2015).

The attached human and economic costs are astronomical, with the U.N having estimated the figure for people driven beneath the poverty line in Syria to be upwards of 2 million (Worth 2010). Admittedly, state policies in Syria maintained a high economic dependence on agriculture, leading to the over-exploitation of groundwater resources, which inflamed the critical state of affairs (Feitelson & Tubi 2017). Nevertheless, political rebellion and civilian uprising in Syria is in part due to stressed water resources (Plumer 2013). Rising water scarcity and food insecurity hold the title of "The Achilles heel of higher growth prospects" in the Middle East (Devlin 2014).

Chapter 3: National Perspectives of Climate Security

3.1. Israel's Carbon Footprint and the Politics behind the Paris Agreement

On November 14 2016,[27] Israel ratified to the Paris Agreement on Climate Change.[28] Political leaders established a somewhat artificial goal of preventing global greenhouse emissions from reaching concentrations that would cause global average temperatures to rise two degrees Celsius above pre-industrialization levels (Jones and Mace 2016). According to the International Energy Agency (IEA), low carbon technologies and efficiency solutions will require approximately $13.5 trillion of investment by 2030 in order to secure the overall climate change pledges attached to the Paris Agreement (IEA 2015).

The gradual decarbonization of the energy supply is targeted in the coming decades through price mechanisms for carbon, trade emissions permits, carbon taxes and other incentives to keep hydrocarbons in the ground; in addition to technological innovation to either sequester carbon dioxide underground or to have some chemical or biological process for taking it out of the air (Busby 2016). However, even in a post-Paris Agreement world of alleged 'carbon pledge commitments,' a lack of concord surrounds climate change discussions and much of the debate circumvents corresponding action steps (Jones & Mace 2016). Notwithstanding the international community conceded that it was preferable to have "an imperfect, operational agreement than to hold out for a perfect, fully equitable one, which may never be attained" (Tal 2016).

Irrespective of the arguable merits of the Paris Agreement, Israel has declared its intention to soften its carbon footprint:

> Israel intends to achieve an economy-wide unconditional target of recuing its per capita greenhouse gas emissions to 7.7 $_{t}$ CO_{2e} by 2030, which constitutes a reduction of 26 percent below the level in 2005 of 10.4 $_{t}$ $C0_{2e}$ per capita. An interim target of 8.8 $_{t}$ CO_{2e} per capita is expected by 2025 (INDC 2015).[29]

[27] http://www.sviva.gov.il/English/ResourcesandServices/NewsAndEvents/NewsAndMessageDover/Pages/2016/11-November/Israel-Ratifies-Paris-Climate-Agreement.aspx
[28] http://unfccc.int/paris_agreement/items/9485.php
[29] http://www4.unfccc.int/ndcregistry/PublishedDocuments/Israel%20First/Israel%20INDC.pdf

Despite supposedly mounting pressure exerted by the Paris Accord and other international agreements, climate change policy fails to meet its primacy in Israel's political sphere. A clear disconnect[30] exists between the climate change and security targets framed by the Israeli government (Proaktor et al. 2016). To date, efforts to counter Israel's ever-increasing growth in national emissions have been little more than "symbolic" and any vision to transform Israel into a low-carbon economy remains "nebulous" at best (Michaels & Tal 2015; Tal 2015).

Worldwide, the commercial and residential buildings sector is the largest contributor to GHGs, accounting for approximately one-third of emissions and 60% of global energy consumption (IEA 2013). In Israel, the power sector accounts for approximately 50% of total GHG emissions, while the transport sector contributes some 19% (Israel Environment Bulletin vol. 42). It is important to note that calculations of National GHG emissions exclude Israel's fuel mix. This notable exclusion reflects a degree of government bias in appointing Israel's Electricity Authority to submit the country's carbon reduction targets – "…even though it is completely disengaged from areas such as transportation, fuel production, agriculture and construction" (Tal 2016).

Israel contributed 8.8 $_{t}CO_{2e}$ in 2013, up from 3.1 $_{t}CO_{2e}$ in 1960 (World Bank 2017). In comparison, the respective figures for the European Union are significantly lower. The World Bank Data Catalog[31] indicates that Israel is heading in the wrong direction in terms of GHGs emissions (See Annex 2).[32] According to Israel's former Minister of Environmental Protection:

> Reduction of greenhouse gas emissions is an especially difficult challenge in Israel, a country undergoing economic growth against a backdrop of continuous increases in both population and energy consumption (Gilad Erdan 2009).

However, economic growth trade-off arguments seem at best a weak justification for Israel's recent and current per capita emissions, which remain significantly higher than the largest

[30] Critics of the Paris Agreement have been quick to point out that it is "hardly a panacea," since current emission pledges fail to secure meeting the preventative threshold (2 ^{o}C) for cataclysmic feedback cycles and chaotic weather conditions (Tal 2016).
[31] http://data.worldbank.org/data-catalog/
[32] In the EU, GHGs deceased by 23% (1990 and 2014) while GDP grew 46% in the same period (Handrich et al. 2015).

countries sharing Mediterranean coastlines (See Annex 2c). For these reasons, Israel's contributory role to annual GHGs needs evaluating primarily within a closer regional context, through comparison surrounding Middle Eastern countries and nearby Mediterranean neighbors such as Cyprus, Greece and Malta (See Annex 2d and 2e)

Israel does not represent a major carbon emitter in global terms, dwarfed by carbon footprint giants like China, USA and India.[33] Nevertheless, Israel would be ill advised to assign the problem of climate change to the major global players. Such a stance would fail to reflect regional nuances and existing inequalities, which may provoke backlash from its regional neighbors. If policymakers resume a largely passive role in future climate change negotiations, Israel is more likely to be held in poor regard by the majority of Arab countries, and seen primarily as an extension of the Western world. Israel's controversial standing as a "good global citizen" in the eyes of its neighbors may exacerbate existing tensions that could deepen the current fracture line in international politics; quite literally the future may bring "rising temperatures and rising conflicts" (Brown & Crawford 2009).

Cases such as Darfur and especially Syria make a prima facie case for the need for "a more holistic climate justice-orientated adaptation approach to prevent situations in which simmering tensions can overflow into conflict" (Das 2016). The drive to exhibit positive "global citizenship" and build a sense of "climate justice"[34] adds extra impetus to the campaign to reduce greenhouse gas emissions (Brown & Crawford 2009). Israel has the capacity to play a constructive role in the international climate change arena. Since Israel is the largest per capita emitter in the Levant[35] largest per capita emitter, policymakers would be misinformed and misguided to settle for a backseat role in climate change negotiations.

[33] Together these countries contribute approximately 50% of global emissions.

[34] A concept built on the platform of equitable development, human rights, and environmental justice – climate justice focuses on the unequal burden of climate change impacts on the most vulnerable and seeks to safeguard their rights, particularly by promoting more equitable and fair allocation of such burdens at the local, national, and international levels (O. Das 2016).

[35] We include Israel, Egypt, Jordan, Lebanon, Palestine and Syria.

3.2. Israel's Security Stance

Effective climate change policies require a long-standing investment in an enduring vision for security and prosperity. Short-term economic and political stresses typically overshadow this achievement. In Israel, "competing economic priorities and the wider international hesitation to transition to a low-carbon economy" subdue progress in climate mitigation and adaptation (Michaels & Tal 2015). The Ministry of Defense is one part of the equation; military expenditure in Israel consistently topples more than 15% of central government expenditure (the highest rate among developed nations), which significantly derails provision for a climate change budget (World Bank 2017; See Annex 3a).

Israel's main perceived security threat stems from military attack. In turn, the Israel Defense Forces (IDF) constitutes the central institution of national security, with a standing army of 168,000 soldiers (MFA 1999; Brown & Crawford 2009). Consequently, the IDF remains prominent in the Israeli public sphere and receives preference in the allocation of human resources, budget and time (Reut Institute 2013). Evidently, exorbitant levels of military spending bring significant opportunity costs, as day-to-day national security challenge complicate long-term investment opportunities in climate change funding (Schueftan 2015; See Annex 3b). Furthermore, on the fiscal side, "Section 17 of the cabinet's decision specifically intimates that no other monies for grant and loans will be allocated to further climate change mitigation" – ostensibly for at least another decade (Tal 2016). The latest government decision also stipulates that any climate-change related measures must meet a "cost-benefit" standard, which is not clearly characterized (Tal 2016).

The national security framework provided by the Reut Institute[36] pinpoints a new reality that may be on the horizon. It sees a potential future in which the United States is increasingly relegated from its position as Israel's "stable rock;" due to recent U.S. engagements in Iraq and Afghanistan and its growing energy independence, coupled to the rise of China and Russia, which lessen U.S. interest in events in Israel (Reut Institue 2013). This development has repercussions across the board, including the domain of climate policy wherein by addressing

[36] http://reutgroup.org/en/?SubjectId=62&Page=2

the security issues in a more comprehensive fashion Israel stands to gain from boosting its overall "soft power" and "superpower" status in the Middle East, irrespective of U.S. influence (Reut Institute 2013).

Policymakers argue that Israel faces national security challenges unique in scope and quality, which require a full harnessing of national resources (Reut Institute 2013). Nevertheless, taking action on climate change stands to serve the best interest of Israel's national security, since "… [Israel] cannot have food security, water security and energy security – or any form of national security – without climate security" (Harris 2012). Given the country's preoccupation with national security concerns and its ascribed geographic vulnerability to climate change, the absence of the issue from Israel's political calculus remains very much an anomaly (Michaels & Tal 2015).

3.3. Policymaking Principles in Israel

For the volumes written about the "dangers" of climate change, the Israeli government has taken comparatively limited action to address these concerns (Stern 2010). Briefly, in 2009, there was some recognition from Israel's leaders of the potential trade benefits and geostrategic opportunities of adopting climate change policy and rhetoric, in addition to serving as a public relations tool (Michaels & Tal 2015). At the time, Minister Erdan declared that Israel would serve as "a regional laboratory and center of excellence for climate change adaptation technologies and renewable energy" (MoEP 2009). Despite reaffirming the potential to "transform Israel into a beta site for climate change technologies," such a vision has not yet come to pass (Shuli Nezer).[37]

Part of the explanation lays with major natural gas deposits discovered in 2009 and 2010 offshore of the port of Haifa. The transition to natural gas transformed the country's domestic energy supply and enabled Israel to become an energy exporter, which consequently further deflated the market for renewable energy **(**Shaffer 2011). Since 2004, a total of 2.3 trillion dollars has been invested in renewables globally,[38] with a record $286 billion invested in 2015, more than six times the amount invested in 2004 (Crone et al. 2016). Given its natural

[37] Senior Deputy Director General for Industry in Environment Protection Ministry in Israel.
[38] http://fs-unep-centre.org/publications/global-trends-renewable-energy-investment-2016

availability of solar energy, Israel is behind the times (See Annex 4). Policymakers have taken few steps to subsidize or promote markets for solar energy, with few exceptions to the rule such as the Ashalim Solar Thermal Power Station.[39] Despite sluggishness to pursue wide-scale solar grids, Israel is the global leader per capita in solar water use, saving two million barrels worth of oil a year; demonstrating the future energy saving potential of renewables (Moskowitz 2010). To date, senior decision makers remain decidedly disengaged from implementing a national strategic masterplan for climate change, reflected by an over-dependency on natural gas (Alterman 2015).

Strategizing for perceived risks should in theory shape the climate change policy-package that the government of Israel commits to delivering in the decades ahead. In practice, however, climate change security has been de-prioritized; despite an underlying awareness of the scope of related threats – "Israel's policymakers acknowledge that climate change is real, but have [largely] failed to integrate its implications into national policy" (Norgaard 2011). Policymakers have grossly overlooked the security components of climate change and downplayed the interconnectedness of threats and risks to Israel's future, thus delaying the transition from mitigation to adaptation and stalling the shift from software to hardware (Cam 2012).

For a variety of reasons, climate change continues to rank low on the Israeli security agenda, and there are few indications that this is set to change in the near future (Alterman 2015). The climate-security nexus has failed to gain sufficient traction in the arena of government policymaking. In essence, there has been a de-prioritization in the realm of Israeli policymaking, in terms of programming priority and financial support. The lack of a comprehensive climate change strategy remains a prevalent default of Israel's governance, while a national energy masterplan is yet to materialize (Tal 2016).

[39] http://www.brightsourceenergy.com/ashalim-solar-project#.WYCFjoiGN1v

Chapter 4: Policy Implications

4.1. National Security towards a Climate compatible future

It is in Israel's self-interest to address the security implications of climate change by adopting a series of policy measures: at the national level, in bilateral regional relations, and at the multilateral level; in ways that advocate a climate leadership position in the Middle East, in conjunction to the region's sensitive geopolitical dynamics.

The current domestic impasse and failure to provide an adequate climate-security budget requires new approaches and reprioritization. Policymakers must realize that climate policy measures or lack thereof will impact "people's lives, livelihoods, asset power and power dynamics" in a myriad of ways, which calls for a government approach that instills the "do not harm principle" (Rüttinger et al. 2015). An approach consistent to these principles requires steps, to "distribute benefits and resources in a conflict-sensitive way that does not aggravate tension between communities" or raise geopolitical red flags. Israel's policymakers must begin to factor into the equation the attached security benefits of a preventative and precautionary climate change policy (Rüttinger et al. 2015).

The framing of climate change risks by the scientific community, and the way those framings inform the application of strategic policy constitutes a key area of research (Weber 2006). Research and policy development goals should be dedicated towards better quantifying and accounting for the full set of climate risks, including potentially catastrophic impacts of low or unknown probability; whether it be ocean acidification or changes in ocean currents and circulation belts (Busby 2016; Feely et al. 2004; Rahmstorf 2000). Risk management policy and the precautionary principle dictate that the government should address the security risks inherent to climate change (Dabelko 2009). These include "tail risks" (low probability but very high impact), and "fat tails;"[40] otherwise referred to as "Black Swan" events – "The impact of the highly improbable" (Busby 2016; Nassim 2007).

A strictly scientific and security agenda, in the absence of holistic government policy and a wider contribution from the social sciences, may lead to a rigid climate change agenda.

[40] Irregularly high likelihood of catastrophic consequences.

National security policy can function effectively by employing flexibility, appropriateness and accuracy, and evolving in tandem to surrounding environmental fluxes by accounting for climate change (Reut Institute 2013). At present, there is an alarming call for increased cross-departmental cooperation to address the impact of climate and environmental change on the dynamics of Israel's national security front. The government plays a critical role in fostering the conditions in which Israeli citizens can act in ways to pursue the lives they value (Sen 2001). The shared role of government policymakers is interconnected, they "supplement" and "reinforce" each other and their instrumentality is only maximized when all are in place (Sen 20011; Barnett and Adger 2007).

Once legitimate policy measures begin to take shape via effective mechanisms, the state can function better as a whole. People gain opportunities for personal development and reduce their anxiety about the future. Conflict resolution mechanisms tend to be effective, and economies tend to grow and poverty levels tend to fall (Sen 2001 Furthermore, the government is better equipped to provide "protective guarantees" to assist people when their livelihoods suddenly contract; whether through the National Insurance Institute of Israel (NII),[41] The Ministry of Social Affairs and Services,[42] or provision from related practices.

4.2. IDF Climate Stress Operations (CSOs)

The U.S. Department of Defense 2014 Climate Change Adaptation Roadmap identifies a host of threats to security operations:

> Sea level rise may impact the execution of amphibious landings; changing temperatures and lengthened seasons could impact operation-timing windows; and increased frequency of extreme weather could impact overflight possibility as well as intelligence, surveillance and reconnaissance capability (U.S. DoD 2014).

Israel's defense operators will encounter similar interventions to their operations and must assess the long and short-term impacts of sea level rise on "naval bases, low-lying airfields, and energy infrastructure" (Paskal 2009).

[41] https://www.btl.gov.il/English%20Homepage/Benefits/Pages/default.aspx
[42] http://www.molsa.gov.il/Units/Wings/agafSpecialJobs/Documents/shirutim%20mitavim_eng.pdf

Following the National Research Council 2013 strategy proposal to the U.S. Intelligence community, the IDF could adopt a system of periodic "stress testing" to assess the performance of physical, socioeconomic and political conditions under different climate change scenarios (National Research Council 2013). This form of simulation involves "analyzing the likely effects of an event at some projected time of occurrence in terms of key variables affecting susceptibility, coping, response, and recovery or the failure thereof, and the likely response" – taking into account national and regional configurations (National Research Council 2013). Such a mechanism provides a key tool for security analysts by identifying weaknesses and blindspots in operational systems, which are crucial to planning for potential climate dynamics.

Climate Stress Operations (CSOs) may be activated by indications that "event likelihood, exposure, or susceptibility is increasing or that the capacity to respond adequately to certain kinds of climate events is declining," in a given suspect zone or vulnerable area (National Research Council 2013). Information and data gathered can assist intelligence operatives to conduct national security risk analysis catered to anticipating susceptibilities and forecasting social, political and security consequences.

4.3. From Stagnation to Innovation

At the outset of approaching climate change mitigation and adaptation measures, it is prudent that policymakers factor in both scientific and anthropological indicators. This combinatory approach is more likely to account for the environmental and societal implications of climate change in the 21st century.

To this day, the physical impacts of climate change remain more widely discussed and better understood than the impending socio-economic and cultural impacts (Adger et al. 2013). The government has an obligation to spearhead a re-engagement of economics, political science, international relations, demography, development studies and anthropology to enable policymakers to assess the causes and consequences of climate change in the Land of Israel (Gemenne et al. 2013). Since as early as 2000, Professor Danny Rabinowitz[43] has propelled the

[43] Author of "Here it Comes: How to Survive Climate Change" (Translated from Hebrew). Rabinowitz was the first to coin the term "Homo Sapiens Combustans – The Burning Man." https://homocombustans.com/about-2/

much-needed parallel engagement from the social sciences by investigating the socio-political nexus and identifying the distributional inequities linked to climate change (Rinat 2010). On the same note, the government should seek to fortify the distribution and abundance of relevant resources in order to satisfy the needs and values of its citizens.

Israel needs to employ systematic, comparative and cross-scale research to enhance its understanding of the links between climate change and national security (Barnett & Adger 2007). An interagency framework is more prepared to anticipate the social and political ramifications of climate events and better qualified to instill a system for monitoring and analysis (National Research Council 2013). Focusing on reducing carbon emissions remains the key priority; to this end, initial steps have begun towards establishing a "National MRV system for measuring, reporting and verifying GHG emissions" (Israel Environment Bulletin vol. 42).

Adaptive capacity refers to "the potential or ability of a system, region, or community to adapt" (Smit & Wendell 2006). Several mechanisms determine these boundaries, including:

> The ability to access commodity markets and labor markets and the prices paid on these markets, the ability of communities to pool resources to collectively respond to change, access to information, population health, and the existence and effectiveness of national and international policies and measures to sustain resources and livelihoods in vulnerable places" (Barnett & Adger 2007).

At present, Israel exerts significant adaptive capacity, with the advent of massive desalination plants on its Mediterranean coastline, which has relieved water scarcity from its status as an existential issue (Tal 2011). Desalination has increased the flexibility of the water supply helping to decouple Israel's water supply from climate, thereby reducing vulnerability to droughts and offering solutions for transboundary water tensions (Feitelson et al. 20111). However, if relations between Israel and Palestine fail to improve, water diplomacy and transborder cooperation between Israel and Jordan must instead set an example for climate diplomacy in the Middle East (Monshipouri 2015).

Israel has the capacity to leverage geopolitical gains from investing in climate change adaptation-strategies – harnessing the power of its technological base and its entrepreneurial

networks – to become a leader in the region. For the State of Israel, "enhancement of adaptive capacity represents a practical means of coping with changes and uncertainties in climate (including variability and extremes)," thus acting as a mechanism to facilitate "threat minimizers" in the face of compounding risks and proliferating dangers (Barry & Wandel 2006; UNGA 2009). In the agricultural sector, climate-smart agricultural practices and better irrigation methods can help to conserve water; thereby adding to the efficiency gains and water loss minimization achieved via large-scale desalination facilities (Al-Otaibi 2015).

Israeli businesses also excel in smart grid technologies, transition methods to Information and Communication Technologies (ICT) and energy management. Climate change presents new opportunities for policymakers to accelerate efficiency mechanisms by encouraging research methods and launching communications systems designed to enhance the Israel's technological powerbase. Adaptive strategies to minimize security risks and mitigate potential conflicts include strengthening institutions, economic wealth, energy systems and other critical infrastructures (Scheffran & Battaglini 2011).

It emerges that there is an ever-growing need for a "whole-of-government approach"[44] united in a joint effort to install corrective policy and allocate sufficient funds towards confronting the prescribed "Climate Conundrum" (Gan 2016). As noted by Israel's Chief Scientist, Dr. Sinaia Netanyahu:

> Adaptation will have to be mainstreamed into decision making in every field by different authorities and a coordinating body will have to be established to lead the implementation process and coordinate between government ministries and public authorities (Netanyahu 2016).

Furthermore, all efforts should follow a "no regrets"[45] philosophy (Siegel & Jorgensen 2011).

[44] A whole-of-government approach can advance the objectives of multiple agencies, avoid duplication of effort, and make better use of scarce resources (National Research Council 2013).

[45] http://www.wri.org/our-work/project/world-resources-report/no-regrets-approach-decision-making-changing-climate-toward

Chapter 5: Policy Recommendations

5.1. A New Governance Toolkit

Multilevel governance equates to a collective effort to solve public problems by merging the local with the national.[46] This kind of system creates interactive layers of governance, as representatives interact across different levels of government (vertical coordination) and among relevant actors at the same level (horizontal coordination) (Huntjens & Nachbar 2015).

At present, numerous attempts on the part of sub-state entities, municipalities, corporations and communities are taking the initiative to make steps towards becoming carbon neutral and improving sustainability (Hoffmann 2011). Such connectivity and flexibility between entities have already formed part of the architecture behind emerging modes of climate governance (Scheffran et al. 2012). A multilevel governance approach to climate change should adopt a "context-specific" approach, which takes into account the operating environment of the local government and other stakeholders; in order to achieve effective cooperation across all levels, with joint information production and exchange (Huntjens & Nachbar 2015). This approach is designed to bridge the gap between top-down and bottom-up processes, since top-down planning is unlikely to factor in micro-level vulnerabilities of climate change and may sidestep key community relations or tensions due to vested interests (Taenzler et al. 2012).

Israel needs to employ a new governance toolkit for climate change mitigation, adaptation and protection. Policymakers and security experts must employ strategic, tactical, operational and reflexive tools in ongoing and future assessments of climate change impacts. Policymakers can help facilitate the move towards increased cooperation through the adoption of more inclusive and reflexive governance mechanisms; producing measurable outcomes that can be monitored and updated. Improved cooperation in policy circles will inform relevant governmental bodies and stakeholders of the merits of a national climate change masterplan, simultaneously promoting wider public awareness and preempting the formation of further obstacles to climate change remediation.

[46] The term characterizes the relationship between public actors situated at different administrative and territorial levels (Huntjens & Nachbar 2015).

5.2. Leveraging for Geopolitical Cooperation and Regional Transformation

In several ways, Israel can leverage for geopolitical stability and new economic opportunities by developing its regional and global presence in the arena of climate change policy. As a prerequisite, Israel must solidify its national climate change plan.

The move from stagnation to innovation should develop state actors and private agents committed to national targets, armed with a repertoire of climate change tools and composite awareness of the climate-security spectrum. In some domains, the private sector can deliver the greatest impact, but in the realm of regulation, finance and information, the government has a pivotal role to play. At the same time, policymakers should seek to harness the transformative power of education by promoting climate justice and engaging the public in climate stewardship[47] (Mary Robinson Foundation 2017). Raising awareness on climate change may help to cultivate a closer culture of "conservation and conversation"[48] in Israel, which could facilitate environmental activism and better resource management at local and national scales.

Developments in climate change adaptation tools can be leveraged in international markets and for diplomacy means, as research, data, equipment and expertise are increasingly networked and exchanged (Wagner et al. 2015). Other nations in the Middle East must also learn to adapt to the idea of climate change networks and recognize that to "overcome diverging interests it is important to build coalitions among those with mutual interests" (Scheffran 2008). Ideally, such operations should fuse "reciprocity, exchange, incentives, trust, and openness" in order to support shared goals, towards the development of Middle-Eastern Mediterranean Alliances (MEMA's) (Wagner et al. 2015). It will take a collaborative effort between the government and private sector to strategize an effective adaptation pathway; however, the underlying policy approach must first pave the way towards successfully upgrading an outmoded climate change plan.

If Israel seeks to maintain its sizeable contribution to humanity, relative to its size, resources and population, in addition to securing a viable and sustainable future, sound policy

[47] http://www.mrfcj.org/principles-of-climate-justice/
[48] Gordon (2017).

principles dictate tackling climate change with immediacy (Reut Institute 2013). Israel can take strides towards minimizing security risks by moving from "conflict to cooperation in climate policy;" seeking inter-ministerial policy motions and regional interactions set towards mitigation, adaptation and resolution (Scheffran & Hannon 2007). As the "Start-Up Nation" seeks to optimize its strategic investments, climate change must become one of the areas at the forefront of Israeli policy and necessary resources should be rallied (Senor & Singer 2009). The remaining strategic dilemma ultimately lies with calibrating the appropriate level of policy intervention and resource allocation, given competing priorities such as military expenditure.

5.3. Future Perspectives

The future configuration of global politics and security in Israel and the Middle East interlinks to energy consumption patterns and the carbon footprint of cities, food systems, infrastructure and buildings (McGregor et al. 2013). Policymakers should begin to envision climate change as a potential geopolitical stabilizer as opposed to a probable jeopardizer. Electricity conservation should become a shared standard with further incentives provided for the adoption of green building infrastructure.

A genuine shift in perspectives and approaches can help to adjust policy efforts towards incentivizing carbon reduction and promoting Israeli clean-tech in global markets. Channelizing and incentivizing positive trade developments for Israeli climate change technologies will play a key role in multiplying the investment of intellectual energies and revolutionizing the "island mentality"[49] of many nations within the Middle East, as they recognize the advantages of cooperation and reciprocity. Meanwhile, socio-technical transitions and socio-ecological resilience[50] must increasingly form part of the fabric of governance mechanisms.

The degree to which the Israeli government prepares and responds to the security risks of climate change will determine the impact levels of migratory pressures, water scarcity, food

[49] Israel remains an isolated "energy island" with no connection to neighboring grids to accommodate usage spikes or other emergencies (Alon Tal), while the Middle East is generally partitioned in its resource distribution and connectivity – unlike the EU.

[50] From a holistic perspective, sustainable security means calibrating current challenges to the underlying need to support the planet's core life-sustaining ecological functions in the future, which also means decoupling economic growth from climate change exacerbation and resource depletion.

security and climate disaster events; establishing the overall resilience of the State of Israel. Climate contingency planning is a necessity in Israel and policymakers should strive to build a climate-resilient economy by integrating the diplomatic-security dimension of climate change into the national security agenda. The prioritizing of a credible mitigation and adaptation plan, in conjunction to maneuvering for stronger geopolitical cooperation, will better situate Israel to deal with the security challenges posed by climate change. Through leadership and exchange, Israel can exercise the necessary tools for mitigating risks and capitalizing upon the emerging socio-economic and diplomatic opportunities presented by climate change.

A climate adaptation mindset should steadily become the policy norm and bring with it fresh governance methods towards a New National Climate Plan – *Leveraging for Geopolitical Cooperation and Regional Transformation*. Israel's new precedent revolves around strategizing for accountability and responsiveness, while targeting peacebuilding and peacekeeping efforts towards a climate-resilient economy and climate-protected society.

Conclusion

Part of the government's long-term objectives should include building interregional and intergenerational security and justice in Israel and the Middle East by making climate change a top security priority. National security plays out on many fronts, both domestically and internationally, and to be effective policy measures must recognize, anticipate and prepare for the multi-dimensional impacts of climate change.

Climate change can evolve into an opportunity for working towards geopolitical stability, as opposed to surrendering to regional instability. This critical shift is possible under a new fabric of governance that takes to heart the full set of risks at hand, whereby climate change mitigation, adaptation and protection meet their primacy. Once climate contingency planning starts to solidify, security mechanisms can develop through different avenues to create a more climate-protected society, in which security challenges and environmental values coalesce.

Climate-security hinges upon four key directions:

1. Multi-level governance
2. New energy pathways
3. IDF Climate-stress Operations (CSOs)
4. Climate stewardship

- Multi-level governance holds the key for climate risk mitigation and strengthening of climate-security. For regional cooperation to develop, national policymakers must first come together under a united front to defend against climate change. A new form of diverse governance, equipped with a flexible toolkit to match, can help bridge the knowledge gaps necessary for employing effective security and sound social policies. Inter-ministerial initiatives and cross-departmental cooperation can send the right signals for Middle-Eastern Mediterranean Alliances and wider climate change coalitions.
- New energy pathways can be fashioned by channelizing the power of Israel's technological and entrepreneurial networks toward climate change mitigation and adaptation beyond the country's immediate borders. The returns on Israeli clean-tech

can help to fuel a renewable revolution closer to home, enabling real investment towards Israel's Intended National Determined Contribution (INDC) CO_2 level.

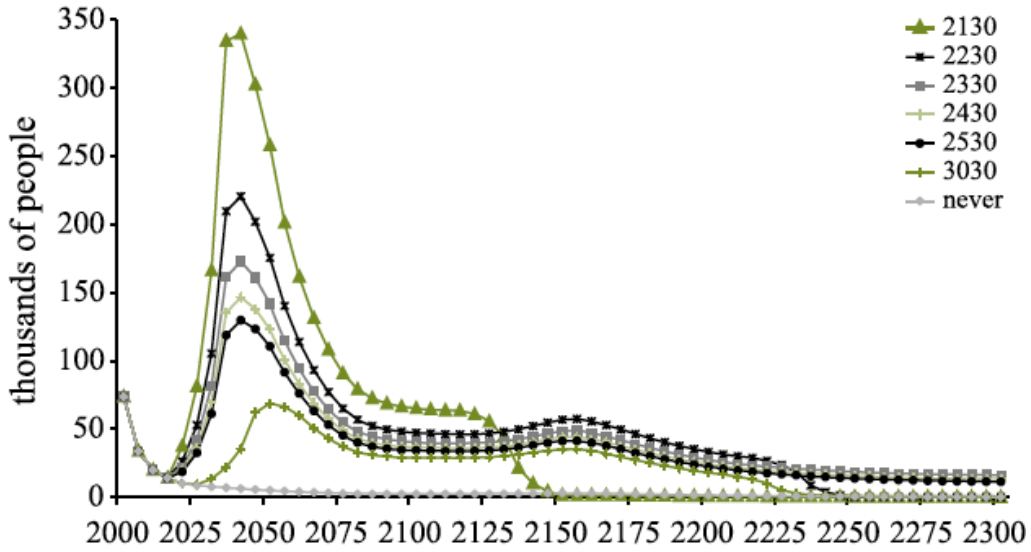
- IDF Climate Stress Operation (CSOs) can strengthen border barriers and security defenses, fortify border zones and "sea fences," and help identify weaknesses and blindspots in operational systems. Incorporating climate-security into the military budget can help to offset the anticipated cost-toll of climate refugees, while tempering climate change "hotspots."
- Climate stewardship reflects the power of the people, seeking to elevate the role of the individual citizen towards carbon-reduction. Environmental education can facilitate empowerment across local scales, as citizens come to internalize the reality of climate change vis-à-vis their own carbon footprint. Climate stewardship is one of the first lines of defense against climate change and sets the path towards reaching climate justice in a climate-protected society.

Climate-security needs to be intact to strengthen long-term commitments toward peace and prosperity in the Middle East. Progress towards this goal also means that a better socio-economic balance and sustainable future draw closer. Taking steps toward strengthening long-term security – within Israel's borders – and consolidating positive regional transformation – across the Middle East – holds the key to neutralizing the impacts of climate change. The time has come for climate change to take its prominent place at the security table.

Annex

Annex 1a:
Global Migration Response to Climate Shocks

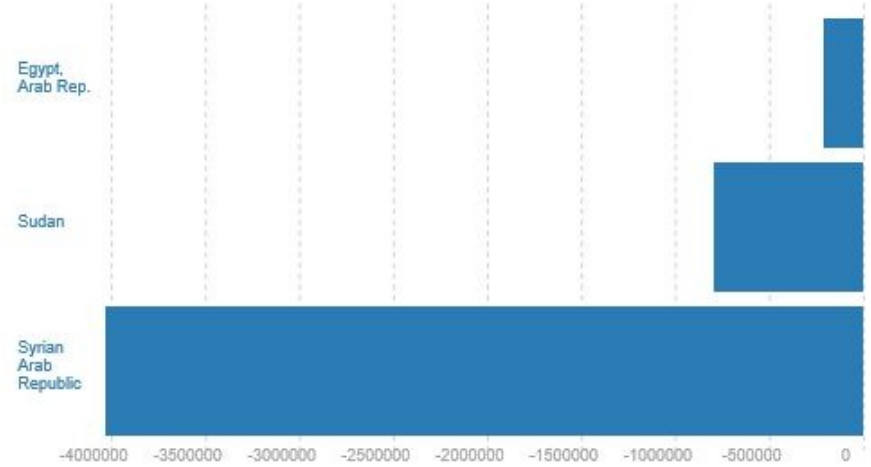
Global annual forced migration as a function of time and WAIS scenario



Source Nicholls et al. 2008 (WAIS: West Antarctic Ice Sheet collapse)

Annex 1b
Net Migration: Egypt, Syria, Sudan (2012)

Net migration is the net total of migrants during the period, that is, the total number of immigrants less the annual number of emigrants, including both citizens and noncitizens. Data are five-year estimates.

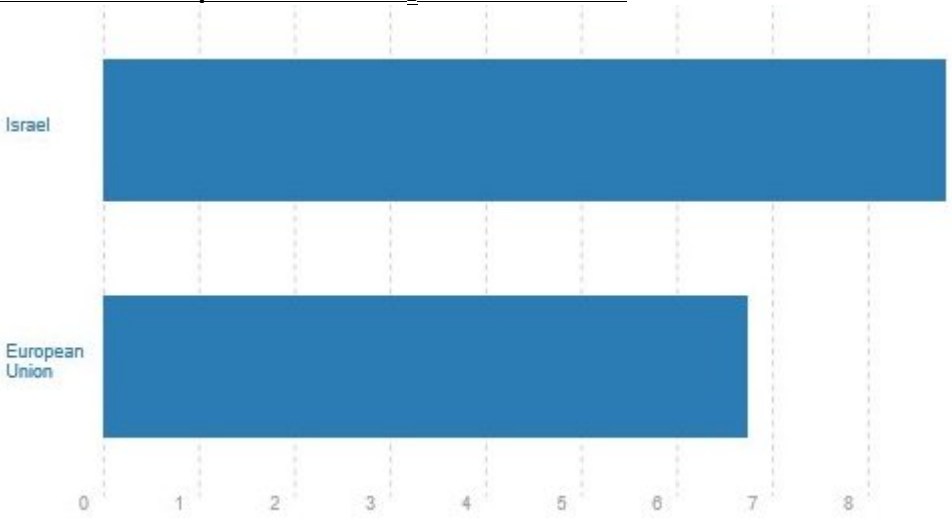


Source: United Nations Population Division, World Population Prospects.

Annex 2a
Israel and European Union 1960-2013

CO_2 Emissions (metric tons per capita): Carbon dioxide emissions are those stemming from the burning of fossil fuels and the manufacture of cement. They include carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring.

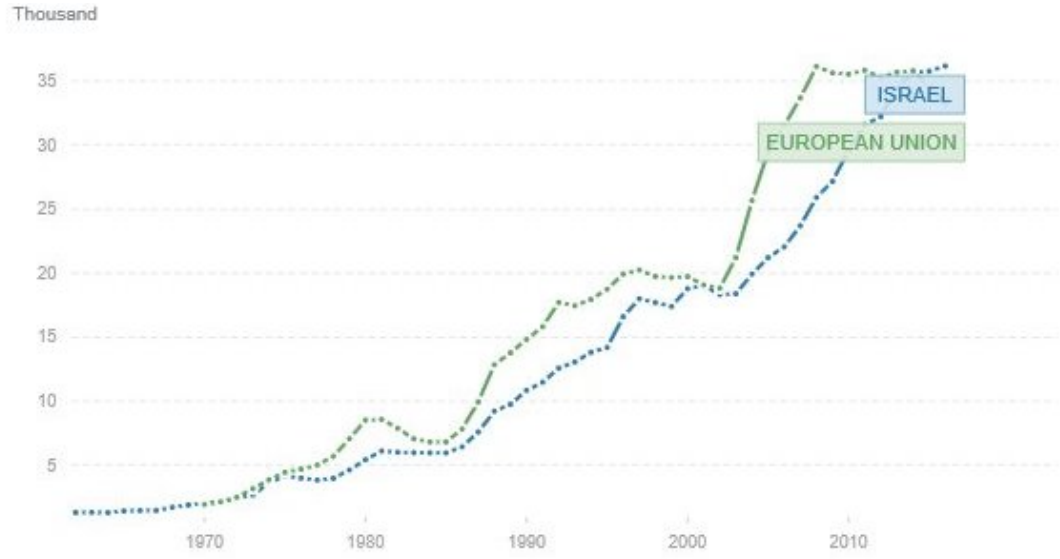
Israel and European Union: CO_2 Emissions 2013



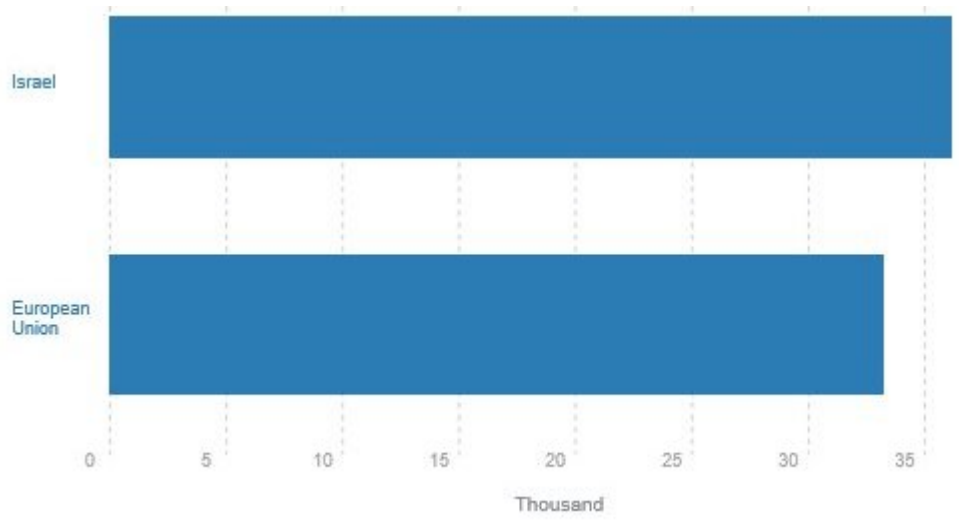
Source: Carbon Dioxide Information Analysis Center, Environmental Sciences Division, Oak Ridge National Laboratory, Tennessee, United States.

Annex 2b
Israel and European Union 1960-2013

GNI per capita, Atlas method (current US$): GNI per capita (formerly GNP per capita) is the gross national income, converted to U.S. dollars using the World Bank Atlas method, divided by the midyear population.



Israel and European Union: GNI per capita 2013

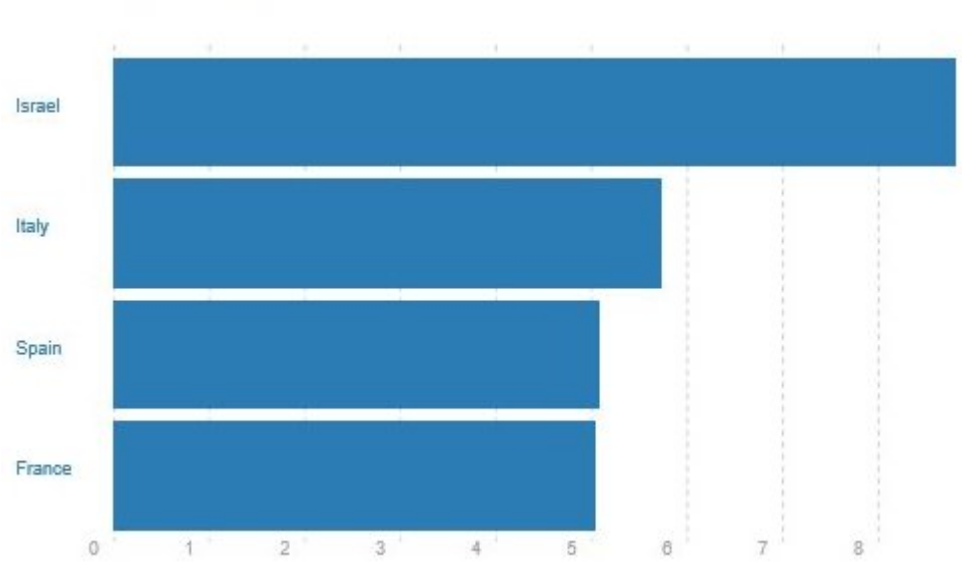


Source: World Bank national accounts data, and OECD National Accounts data files.

Annex 2c
Israel, France, Italy and Spain 1960-2013

CO_2 Emissions (metric tons per capita)

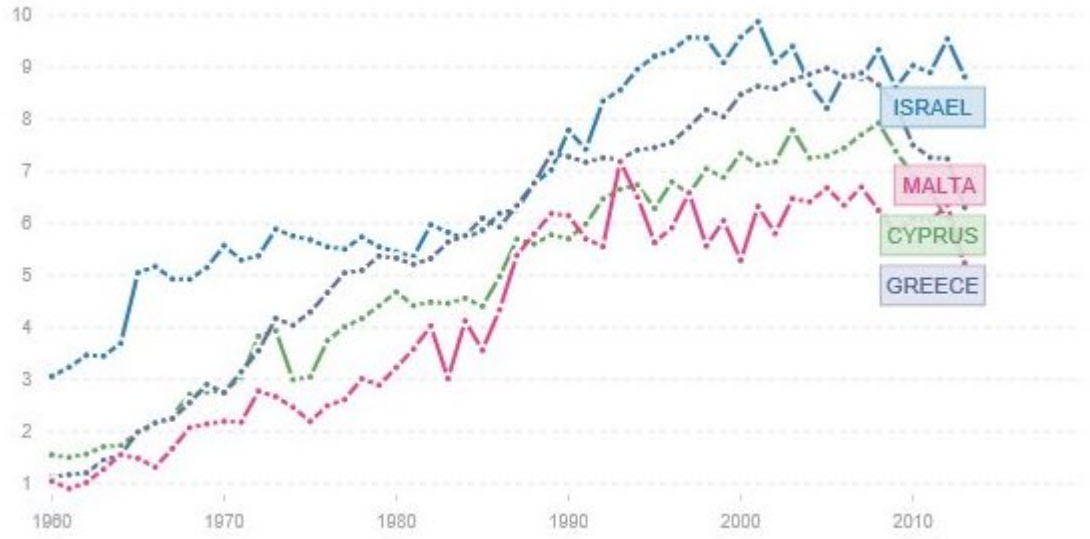
Israel, France, Italy and Spain: CO_2 Emissions 2013



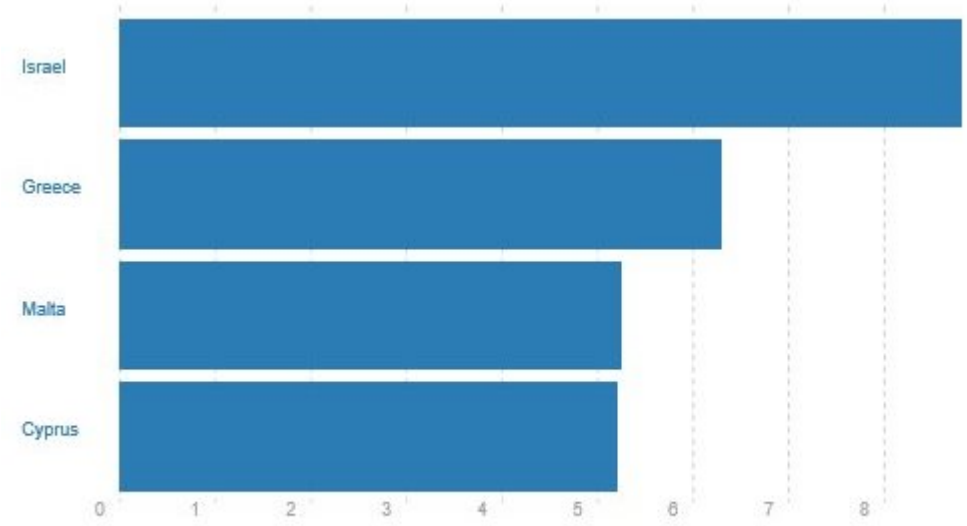
Source: Carbon Dioxide Information Analysis Center, Environmental Sciences Division, Oak Ridge National Laboratory, Tennessee, United States.

Annex 2d
Israel, Cyprus Greece and Malta 1960-2013

CO_2 Emissions (metric tons per capita)



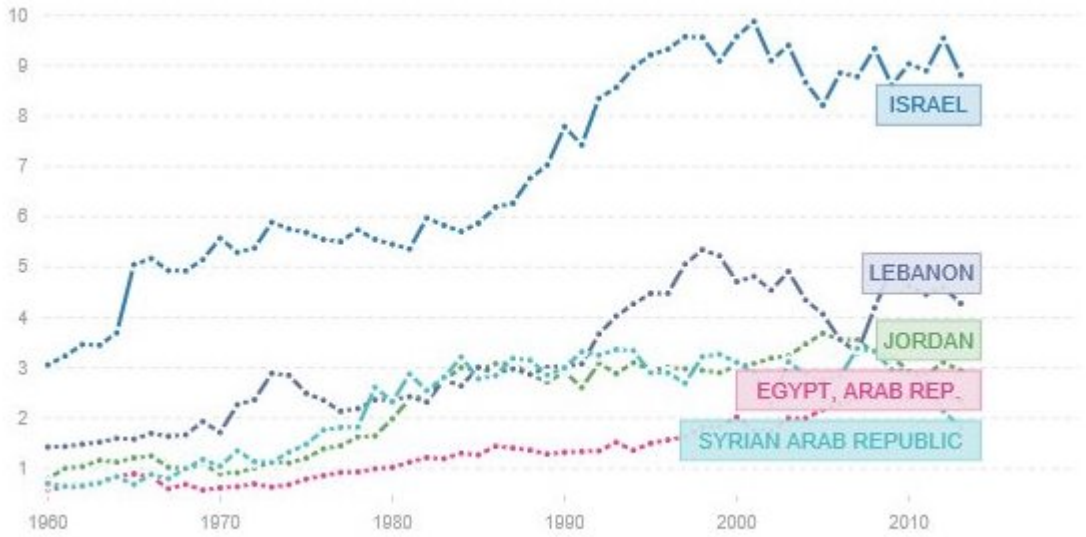
Israel, Cyprus Greece and Malta: CO_2 Emissions 2013



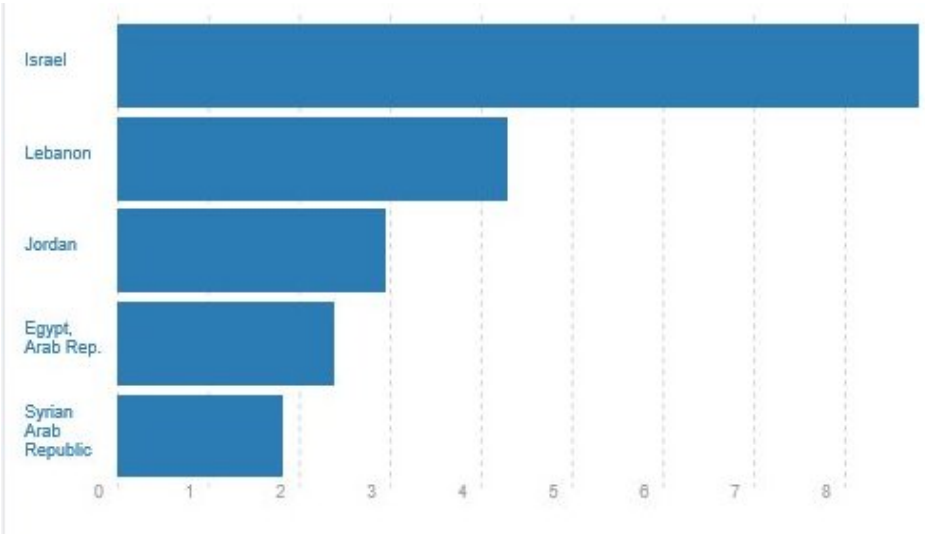
Source: Carbon Dioxide Information Analysis Center, Environmental Sciences Division, Oak Ridge National Laboratory, Tennessee, United States.

Annex 2e
Israel, Egypt, Jordan, Lebanon and Syria 1960-2013

CO_2 Emissions (metric tons per capita



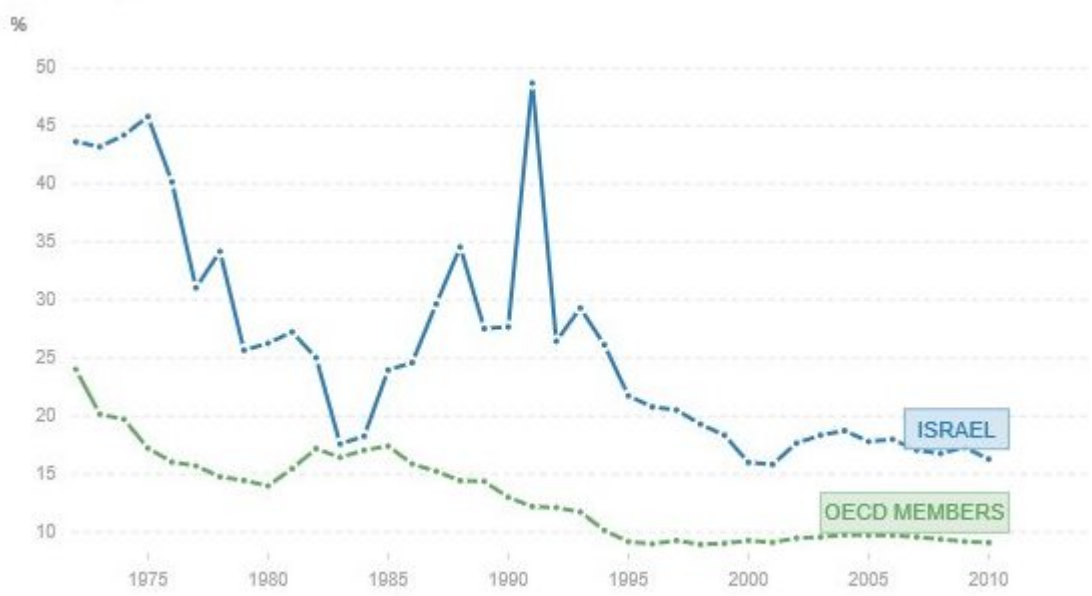
Israel, Egypt, Jordan, Lebanon and Syria: CO_2 Emissions 2013



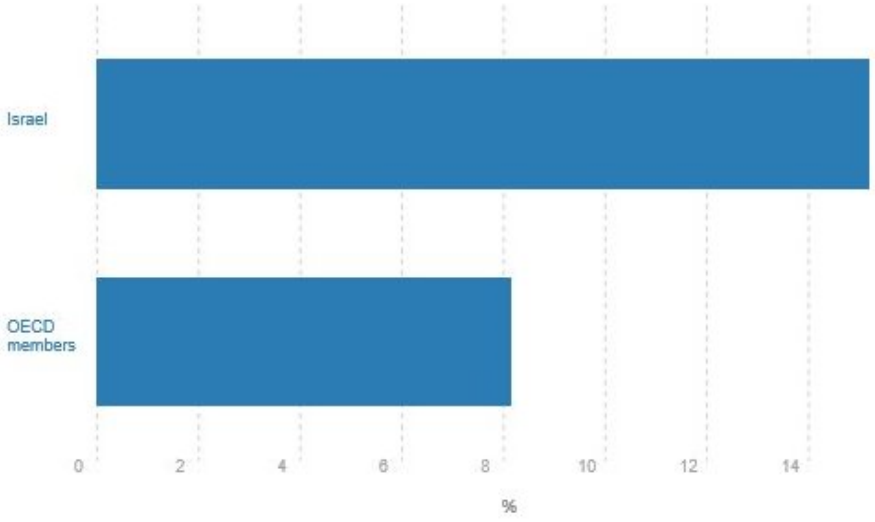
Source: Carbon Dioxide Information Analysis Center, Environmental Sciences Division, Oak Ridge National Laboratory, Tennessee, United States.

Annex 3a
Israel and the OECD 1972-2016

Military expenditure (% of central government expenditure)



Israel and the OECD: Central Government military expenditure 2015

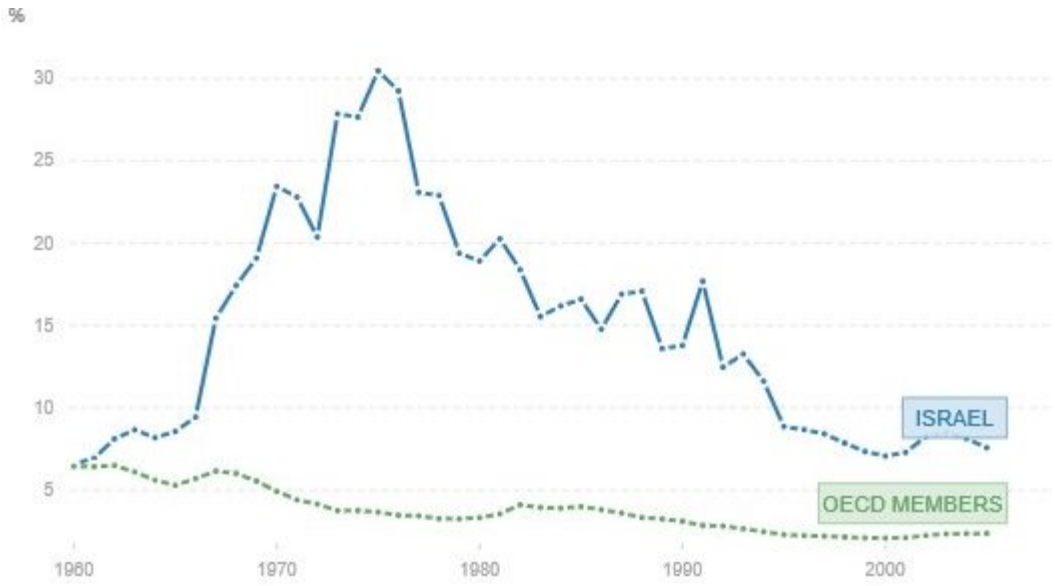


Source: Stockholm International Peace Research Institute (SIPRI), Yearbook: Armaments, Disarmament and International Security.

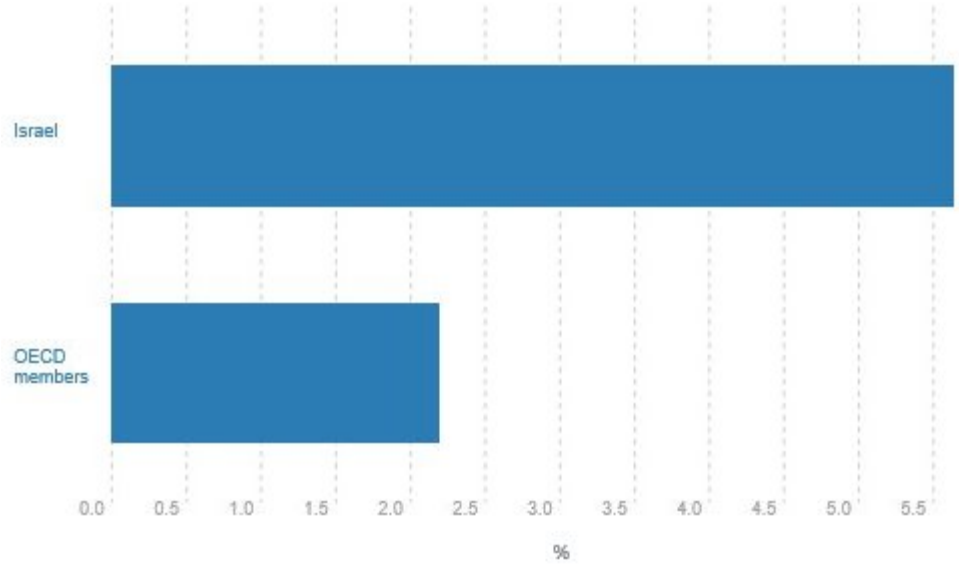
Annex 3b:

Israel and the OECD 1960-2016

Military expenditure (% of GDP)



Israel and the OECD: Military expenditure (% of GDP) 2016

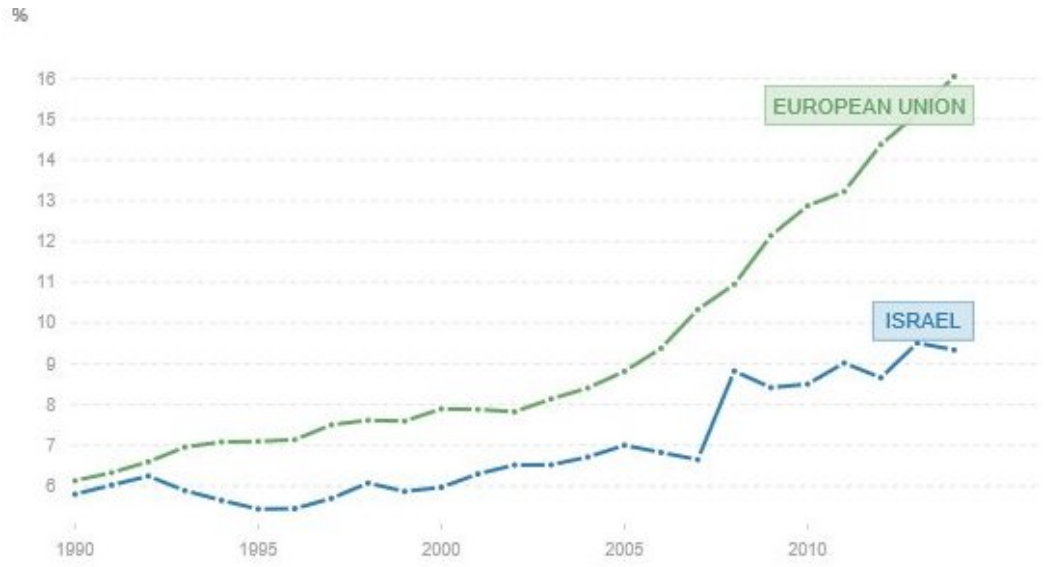


Source: Stockholm International Peace Research Institute (SIPRI), Yearbook: Armaments, Disarmament and International.

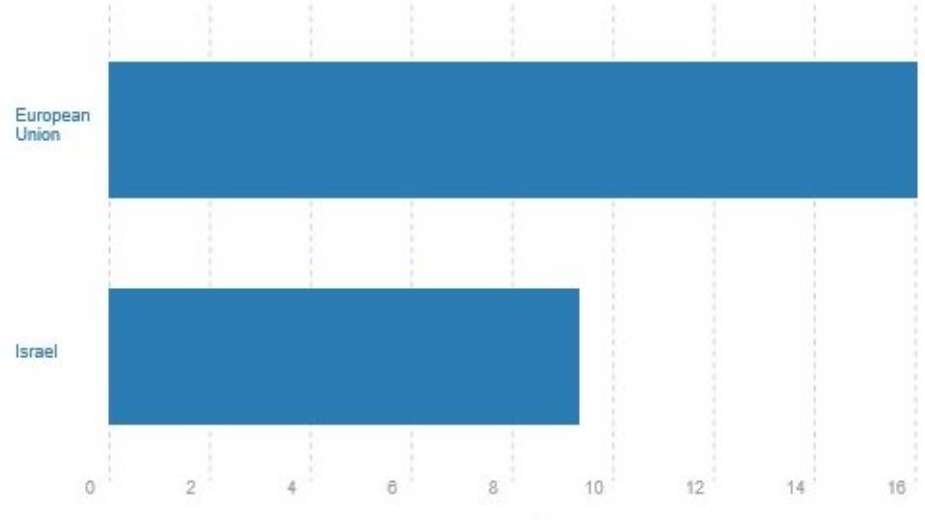
Annex 4:
Israel and the European Union (1990-2014)

Renewable energy consumption (% of total final energy consumption):

Renewable energy consumption is the share of renewables energy in total final energy consumption



Israel and the European Union: Renewable Energy Consumption 2014



Source: World Bank, Sustainable Energy for All (SE4ALL) database from the SE4ALL Global Tracking Framework led jointly by the World Bank, International Energy Agency, and the Energy Sector Management Assistance Program.

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vulnerability to disaster." *Natural Disaster and Development in a Globalizing World, Routledge London* (2003): 19-43.

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The Association of Environmental Justice in Israel (AEJI) is a non-partisan, independent body, research and resources oriented center, set up in 2009. The center focuses on the inter-connectedness of society, environment and the decision-making framework in Israel to produce policy recommendations that are real and acceptable while promoting the strengthening of democracy, equality and environmental justice values. It also aims to promote active deliberated civic participation especially of minorities and residents of the periphery.

The Association is active in four main areas:

A. Initiating of researches and working papers on environmental justice core issues, including climate policy and governance, social economy, resilient communities, methodology of inequality indexes.

B. Data collection aimed to establish informative infrastructure on socio-economic aspects of environment and climate for researchers, policy advisors and decision-makers.

C. Development of policy tools that promote a policy based on the values of democracy, equality and environmental and climate justice.

D. Increasing civic participation in matters of environmental justice and decision-making processes regarding environment and society, as well as empowering civil society especially among vulnerable groups such as women, minorities and residents of the periphery.

AEJI
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