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ADMINISTRATION**

**REFLECTIONS ON ENVIRONMENTAL MIGRATION  
AS A GLOBAL ENVIRONMENTAL PROBLEM IN  
SOUTHEAST ASIA AND THE MIDDLE EAST**



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**M.A. THESIS**

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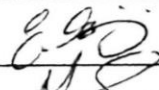
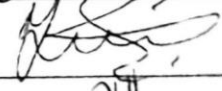



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### ETHICS

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I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that as required by these rules, I have fully cited and referenced all material and results that are not original to this study.

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**Göç insanlık tarihi kadar eski bir olgu ve bireysel bir ikilem olarak her daim araştırmalara konu olmaktadır. Ancak çevresel kaynaklı göç oldukça yeni bir araştırma alanıdır. Çevresel göçü konu edinen bu çalışma, Orta Doğu ve Güneydoğu Asya bölgelerine ve ülkelerine odaklanmıştır, Çünkü bu bölgeler, çevresel felaketler karşısında en hassas ve göç potansiyeli açısından en kırılgan bölgeler olarak görülmektedir.**

**Dört ana bölümden oluşan çalışmanın İlk bölümünde, küresel çevre sorunları ve buna bağlı göç kavramsal ve hukuksal olarak ele alınmıştır. İkinci ve üçüncü bölümlerde sırasıyla Güneydoğu Asya ve Ortadoğu ülkelerindeki çevresel kaynaklı göç nedenleri, göç verileri ve nüfus hareketini hızlandıracak risk faktörleri analiz edilmektedir.**

**Çalışmanın son bölümünde de Orta Doğu ve Güneydoğu Asya ülkelerindeki çevresel göçlerin, küresel, uluslararası ve ulusal düzeylerde hangi araçlarla yönlendirilebileceği, risk azaltma ve uyum stratejilerinin neler olduğu, özellikle iklim değişikliğine ilişkin politikalar ve afet yönetimi bağlamında ele alınmaktadır.**

**Anahtar Kelimeler: Çevresel Göç, Göç, Güneydoğu Asya, Orta Doğu, İklim Değişikliği, Etki Azaltma ve Uyum, Afet Yönetimi**

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### ABSTRACT

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Migration has always been the subject of research as a phenomenon and a distinct predicament as old as human history. However, at this time and date, environmental migration is a relatively new area of research. This study focused on environmental migration in the regions of the Middle East and Southeast Asia and its countries since they are seen as the most vulnerable and exposed with the eventuality of migration in the face of environmental disasters.

The study is comprised of four main sections. Global environmental problems and migration-related concepts are elaborated in the first chapter of this research. In the second and third chapters, on the one hand, the problems and risks of both regions and its countries concerning environmental migration were analyzed.

The mitigation and adaptation strategies adapted in the international and national levels across the Middle East and Southeast Asia were deliberated in place of curbing the effects of climate change which in the long run incites migration. Disaster management initiatives were, on the one hand, expounded based on the regional and national frameworks of countries of both regions that aim to reduce, to lessen and to prevent any damages to human security, economy and the environment. As for environmental migration, it is a necessary tool to manage the number of population displacements because of natural disasters.

**Keywords:** Environmental Migration, Migration, Environmental displacement Southeast Asia, the Middle East, Climate Change, Mitigation and Adaptation

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## ABBREVIATIONS AND ACRONYMS

<b>ABM</b>	– agent-based model
<b>ADB</b>	– Asian Development Bank
<b>AF</b>	– Adaptation Fund
<b>ASEAN</b>	– Association of Southeast Asian Nations
<b>CDRI</b>	– Cambodia Development Resource Institute
<b>CFE-DM</b>	– Centre for Excellence in Disaster Management and Humanitarian Assistance
<b>COP</b>	– Conference of Parties
<b>DRM</b>	– disaster risk management
<b>EDP</b>	– environmentally displaced person
<b>EM-DAT</b>	– emergency events database
<b>FAO</b>	– Food and Agriculture Organization
<b>FMECD</b>	– Federal Minister for Economic Cooperation and Development
<b>GDG</b>	– Gender and Development Group
<b>GDP</b>	– Gross Domestic Product
<b>GHG</b>	– greenhouse gas
<b>HCT</b>	– Humanitarian Country Team
<b>IDMC</b>	– The Internal Displacement Monitoring Centre
<b>IDP</b>	– internally displaced person
<b>IFAD</b>	– International Fund For Agricultural Development
<b>IFRCRCS</b>	– International Federation of Red Cross and Red Crescent Societies
<b>INDC</b>	– intended nationally determined contribution
<b>IOM</b>	– International Organization on Migration
<b>IPCC</b>	– Intergovernmental Panel on Climate Change
<b>IPCCC</b>	– Intergovernmental Panel on Climate Change
<b>ISDRRM</b>	– Islamic Strategy for Disaster Risk Reduction and Management
<b>LDCF</b>	– least developed countries fund
<b>LMB</b>	– Lower Mekong Basin
<b>MEU</b>	– Ministry of Environment and Urbanization
<b>MOE</b>	– Ministry of Environment
<b>MoNRE</b>	– Ministry of Natural Resources and Environment
<b>MoNREC</b>	– Ministry of Natural Resources and Environmental Conservation
<b>NAPA</b>	– National Adaptation Programmes of Action
<b>NDC</b>	– national determined contribution
<b>OECD</b>	– Organisation for Economic Co-operation and Development
<b>RCP</b>	– representative concentration pathway
<b>SDG</b>	– sustainable development goals
<b>SLR</b>	– sea-level rise
<b>TRNC</b>	– Turkish Republic of Northern Cyprus
<b>UN</b>	– United Nations
<b>UNDP</b>	– United Nations Development Programme
<b>UNFCCC</b>	– United Nations Framework Convention on Climate Change
<b>UNHCR</b>	– United Nations High Commissioner for Refugees
<b>UNISDR</b>	– United Nations International Strategy for Disaster Reduction
<b>WEF</b>	– World Economic Forum
<b>WFP</b>	– World Food Programme

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## INTRODUCTION

Thousands of years ago, humankind has initially been hunters who lived together in small groups transferring from one place to another with absolutely no fixed abode basically to hunt for food like wild animals and some edible plants. It was about 13,000 to 10,000 years back when people began to raise animals and grow their food, which translated to a significant human dealing that made them settle in one particular place<sup>1</sup>. However, the environment through time changes, and it is scientifically unavoidable. The change in the ecosystem, whether it is big or small, can always create countless bearing to humankind. Adaptation comes when a local community rigorously experiences the change in the environment, thus installing possibilities for them, too, to change like the course of migration.

History can profoundly elucidate how all environmental changes<sup>2</sup>, even in its simplest forms, affect human activities, and the same goes to the ecosystem with regards to the drastic human misconduct of natural capitals, a relatively vis-à-vis sequence. Migration in itself can reasonably be induced by significant environmental alarms relating to the ecological imbalance because of the proliferating environmental degradation, the abuse of natural resources, which is indispensable for industrialization, and of course, climate change being an evolving global environmental agitation that can trigger the magnitudes of social migratory incidence.

The International Organization for Migration has expounded ‘environmental migrant’ as terminology which refers to a person or group of people who transfers from one place to another because of the sudden change in their local environment that distresses their living conditions and is understood to either establish temporary or permanent migration arrangement leaving their habitual residence to move within its country’s borders or externally<sup>3</sup>.

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<sup>1</sup> Sally Morgan, “Changing Planet: what is the environmental impact of human migration and settlement?,” *Investigating Human Migration and Settlement*, 2010, p. 5.

<sup>2</sup> Environmental changes, as a term in this study, is elaborated as the changes instigated by several variations of environmental degradation and destruction in the forms of desertification, deforestation, loss of biodiversity and other activities that cause the changes in the environment. It similarly implies also to the disturbance of the ecosystem mostly induced by human undertakings and natural systems, including natural disasters, and relatively climate change.

<sup>3</sup> IOM, Glossary on Migration, Geneva: UN Migration, 2019, p. 63.

Environmental migration, on one point, adheres to the progression of human resettlement as for the immediate or longstanding changes of inhabitants' local environment that compromises their livelihood and threatens their security hence compelled to leave their home region and move to another place where they feel socially and ecologically secured.

It is projected that the outlook of migration in the future would also be applied to the communities relocated to another habitation due to environmental insecurities instigated by the deterioration of the environment and natural calamities, i.e., earthquake, tsunami, volcanic eruption, etcetera. Some of the environmentally stirred resettlement for migrants is almost certainly considered to be an acute or long term movement and internal migration, a process of migration arrangement within a nation or a state. Other than internal population movement incited by environmental problems, transnational migratory events can also happen across borders when people seek refuge to another place because of the actuality of insecurity from their local environment.

The Red Cross together with the Red Crescent projected in their 2001 World Disaster Report 25 million refugees induced by environmental upheavals<sup>4</sup>, and by 2050 or ahead, global warming can be of intimidation to a colossal figure of the world population which denotes the fact that 50 million lives will be at severe risk because of augmented environmental problems and climate-related distress<sup>5</sup>. To deliver a precise number as a stance, 'one in every 45 people' on a global scale can be displaced by climate change exceeding the migrant population in the world<sup>6</sup>.

Climate change is seen to construct diverse patterns of environmental migration on a global scale, and it is substantial to take into account that the ice in Arctic and Antarctica through time are abruptly melting prompted by the intensifying temperature. On the one hand, the sudden alteration of climate conditions can eventually foster a vast chance of transnational and domestic migration because of the escalating sea-level rise, which can primarily occur to coastal and island countries like

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<sup>4</sup> IFRCRCS, "The World Disasters Report 2001," 2001, p. 11.

<sup>5</sup> Norman Myers, *Environmental Refugees: A growing phenomenon of the 21st century*. London: Royal Society of London, 2002, p. 611.

<sup>6</sup> IOM, *Migration and Climate Change*, Ed. Oli Brown, Geneva, 2008, p. 1.

the Philippines and Indonesia of Southeast Asia and several countries in the world. Aside from that, tremendous natural disasters like intense tropical storms, drought, and flooding integrating insecurity arrangement in food production and water supply are other contributory factors instrumental in shaping human population movement.

In 2010 the extreme shock of climate change has been apparent in South Asia, Southeast Asia and the Pacific that created more than 30 million displaced due to natural calamities<sup>7</sup> and in the forthcoming years because of the sudden alteration of climate the prevailing migration arrangements can worsen rough geographical movement of the human population is likely to emerge<sup>8</sup>. It may also induct transnational movements across the region where people from Cambodia, Vietnam, and some parts of Indonesia may opt to migrate to Malaysia, Burmese to Thailand and Malaysia and Filipinos moving to different parts of the region<sup>9</sup>.

The exceptional case of the Middle East carrying countless gravity of political instability that led to a seemingly never-ending war in Yemen, Iraq, and especially in Syria has produced massive migratory events ever transpired in human history. However, with the risks environmental changes bring to the region including climate change, food and water insecurity is perceived to form a unique migratory pattern since the region is prone to drought and stern temperature not to mention the likelihood of a sea-level rise in the Mediterranean that can intimidate coastline metropolises and small local communities.

It is a fact that environmental insecurity, environmental degradation, extreme natural disasters and including changing climate are categorically not only the sole factor driving migration; however, its consequences are surfacing through time. It is imperative to express that it outlines evident conditions leading a distinctive human population movement predominantly in the Mediterranean littoral<sup>10</sup> that may have bearing to some Middle Eastern countries such as Egypt, Syria, Lebanon, Israel, Cyprus, and Turkey.

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<sup>7</sup> ADB, *Facing the Challenges of Environmental Migration*, ADB, 2011, p. 1.

<sup>8</sup> ADB, *Climate change and migration in Asia and the Pacific*, ADB Brief, Mandaluyong: ADB, 2009, p. 11.

<sup>9</sup> NIC, "Southeast Asia: The Impact of Climate Change to 2030: Geopolitical Implications." *Conference Report*, 2010, p. 4.

<sup>10</sup> Michael Werz & Max Hoffman, *Climate Change and Migration in the Mediterranean: Challenges for the Future*, Barcelona: European Institute of the Mediterranean Yearbook, 2017, p. 270.

In a study conducted by the World Bank, it emphasizes that Syria, Egypt, and Yemen have experienced environmental shocks as perceived by a significant figure of households considering there is an immense alteration to climatic conditions that cause more irregular rain patterns and warmer temperatures which can result to drought and less fertile lands<sup>11</sup>. The risk of migration internally and even externally is high, reflecting on the effects of environmental change and the alteration of climate pose to the human population perceived to be supplementary to the real migration crisis in the region. The predicaments of migration are indeed realistic in this corner of the world, demanding governments to design policies grounded on mechanisms of climate change adaptation and mitigation.

It is further argued that climate change will create a distinct classification on the progression of migration, due to the climate inconsistency such as; tremendous amount of precipitation, high climate temperature, intense tropical storms, and community destruction because of flash floods, landslides, wildfires, and etcetera, hence, in an unusual stance, these environmental incidents will perhaps impact the prevailing arrays of migration whether it is internal or transnational.

Moreover, it is clear that environmental migration indicates a substantial effect on domestic migration with all the recorded natural disasters and climate impacts. Accordingly, in terms of international migration, the transnational or trans-boundary process of migrations are happening nowadays with regards to economic and occupational activity, family-related resettlement and political insecurity encompassing the paramount justification of environmental migratory movement due to natural disaster vulnerability, inaccessible natural assets, environmental insecurity and the total absence of livelihood.

Environmental migration is an emerging global dilemma triggered mainly by the aftermaths of climate change and other ecologically illicit undertakings of humankind. Southeast Asia and the Middle East are two distinct regions of Asia where its respective countries suffer from socio-political insecurity, and in no time, a never before seen societal challenge can occur linking to the migratory movement stirred by

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<sup>11</sup> The World Bank, *Climate Change and Migration: Evidence from the Middle East and North Africa*, Ed. Quentin Wodon, et al., Washington, DC., 2014, pp. 8-11.

environmental concerns contemplating migration itself as one of the clamouring dilemmas of today.

Environmental migration triggered by natural calamities, environmental degradation and climate change constitutes an essential dimension of human population movement patterns. The ideal conditions of human resettlement create substantial risks that are superficial in both regions of Southeast Asia and the Middle East. This study was designed to contribute to the literature on environmental migration. Hence, it aimed to elaborate environmental migration as one of the critical environmental issues of today; it scrutinized the extent of comparison on the vulnerabilities of Southeast Asia and the Middle East on the reality of environmental migration driven by environmental problems and climate change; and lastly, it evaluated the political strategies and approaches on environmental migration and climate change in the international and national settings.

In this context, the first chapter of this study undertook the overview of environmental migration and the motivation of population movement induced by several environmental facets. Furthermore, the second and the third chapters were deliberated to review the extent of risks of the countries in both regions of Southeast Asia and the Middle East in terms of natural disasters and climate change that instigate migration. Lastly, the fourth chapter organized the mitigation and adaptation strategies established by the governments in these regions to curb the impacts and to prevent loss. In-depth political strategies can develop comprehensive measures in altering the conclusion of climate change and other factors that drive environmental migration.

## REVIEW OF RELATED LITERATURE

A literature review method was utilized in the conduct of this research. Within its scope, the theoretical concept of the study was arranged mainly from foreign references since Turkish literature is considerably limited to the research topic. In addition, all accessible information conferring environmental migration in Southeast Asia and the Middle East including its associated themes by means of scientific studies, theses, journals, news reports, governmental policy strategies, nongovernmental institutions' reports, and informative statistics from international organizations were used as the research materials for this study and were compiled and thoroughly reviewed for data collection procedure.

Comprehensive and informative data accumulated from the research materials concerning the pragmatic conditions of Southeast Asia and the Middle East about environmental migration, climate change, and related political strategies were deliberately analyzed. It commenced to a comparative evaluation in determining the extent of the weightiness of this emerging global environmental problem to these regions. Supplementary materials found to be relevant to environmental migration, climate change, and environmental-political undertakings were also primarily explored.

Migration in itself, conversely, can realistically be stimulated by environmental alarms backed by extreme weather events, environmental degradation and climate change. The latter, being an evolving global environmental agitation, it can trigger the scales of social migratory incidence. In light of the accounted shreds of literature about the synopsis on the nexus of climate change, environmental changes, and migration, it expounds that:

According to the IOM, the most significant distinct influence of climate change could be on human migration having millions of population displaced by coastal erosion, flooding, and fragmented agricultural systems<sup>12</sup>. Experts concur that the environment is but one of the countless motives people move from one place to

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<sup>12</sup> IOM, *Migration and Climate Change*, Ed. Ilse Pinto-Dobernig. Vol. 31, IOM Migration Research Series, 2008, p. 16.

another, occasionally operating on its own but more frequently through other means—predominantly loss of livelihoods prompted by environmental interference<sup>13</sup>. Hugo reiterated that notwithstanding the "conceptual fuzziness," the idea of environmental migrants remains a contested one in academic circles. Environmental systems are increasingly substantial in both stimulating migration and the evaluation of the impression of migrations<sup>14</sup>.

ADB justified in their report that, alterations to migration arrangements would take different forms. However, it is possible to involve an increase in the push factors that may lead to emigration pressures relating to three primary systems: (i) increase in environmental hazards; (ii) change in resource conditions; and (iii) the risks of climate change impacts<sup>15</sup>.

In 1995, as argued by Myers, environmental refugees reached an absolute number of at least 25 million, matched with 27 million conventional refugees due to political oppression, persecution, religious, and ethnic intimidations. The sources of environmental displacement are desertification, deforestation, water salinization of farmsteads, and biodiversity depletion. In due time, these are becoming macro-level variations that may prime to stress on land and other natural capitals<sup>16</sup>.

The practical impression expanded from the brief review made by Black re the presented works on “environmental refugees” considers that it is a unique factor among others that adhered to theoretical rigidity. Besides, there rests a chance that academic and policy inscription has a lot to do with bureaucratic strategies of international organizations and academicians than with any factual theoretical or empirical insight on the environmental refugee<sup>17</sup>.

On the contrary, Castles rationalized that there does not surface as a resounding case where environmental factors cause major violent conflicts, which in reoccurrence

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<sup>13</sup> Susan Martin, “Managing environmentally induced migration,” *Migration, Environment and Climate Change: Assessing the Evidence*. Ed. Frank Laczko and Christine Aghazarm. Geneva: IOM, 2009, p. 353.

<sup>14</sup> Graeme Hugo, *Migration, Development and Environment*, Vol. 35, Geneva: IOM, 2008, p. 47.

<sup>15</sup> ADB, *Addressing Climate Change and Migration in Asia and the Pacific*, Mandaluyong: ADB, 2012, p. 74.

<sup>16</sup> Norman Myers. “Environmental Refugees.” *Population and Environment: A journal of Interdisciplinary Studies* 19, 1997, pp. 167–168.

<sup>17</sup> Richard Black, “Environmental refugees: myth or reality?,” *New Issues in Refugee Research* 34, 2001, pp. 13-14.

incite a massive course of displaced people. In contrast, other factors such as political oppression, tribal conflicts, and economic constraints appear to be far more extensive in triggering violence and war<sup>18</sup>.

Recent studies somehow vary with Castles' claim, Piguete's methodological review in his research on the nexus of climate change, environmental degradation to migration is that human movement itself induced by environmental changes intervenes as a coping strategy in its response to these phenomena. The local and regional scenarios on migratory arrangements incited by climate change per se are conceivable, and migration is one of the wide-ranging reactions to any environmental upheaval<sup>19</sup>. Laczko and Piguete explained that migration is a coping mechanism to environmental stress and is often the last-resort choice, once a specific threshold of ecological stress is felt. It is deliberately an upshot of a prearranged of livelihood options, outlined by a mix of biophysical and socio-economic and socio-political contexts<sup>20</sup>.

Raleigh, Jordan, and Salehyan's work on the synopsis of climate change and migration indicates that there is an apparent demand for governments in especially in developing countries, to consider strategies for reducing hazard risk and increasing mitigation and adaptation to the impacts of climate change. Their research suggests that “*labour, distress, and relocation*” are three chief responses instantly shaped by environmental changes<sup>21</sup>. Furthermore, results from the experiment conducted by Entwisle et al. using an agent-based model (ABM) indicated that migration as a response to climate shocks is indeed possible and even with unrealistically extreme climate conditions and unrealistically extreme adaptive response, the change in migration pattern is only unexceptional<sup>22</sup>.

On a side note, Jabin contended that the impacts of climate change on the environment and human systems are seen tangible and can create a conceivable

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<sup>18</sup> Stephen Castles, “Environmental change and forced migration: making sense of the debate,” *New Issues in Refugee Research* 70, 2002, p. 7.

<sup>19</sup> Etienne Piguete, Linking climate change, environmental degradation, and migration: a methodological overview, 2010, p. 522.

<sup>20</sup> Frank Laczko and Etienne Piguete, “The Regional Impact of Environmental Change on Migration,” *People on the Move in a Changing Climate* 2, 2014, pp. 16–17.

<sup>21</sup> Clionadh Raleigh, Lisa Jordan & Idean Salehyan, *Assessing the Impact of Climate Change on Migration and Conflict*, 2008, pp. 38–39.

<sup>22</sup> Barbara Entwisle, et al., “Climate shocks and migration: an agent-based modeling approach.” *Population and Environment*, 2016, p. 67.

interference to economic activities hurting the agriculture productions and other industries. A substantial percentage of the human population may fall subject to migration and relocation, taking to account the serious bearing of extreme weather patterns. Ergo, climate change is immensely linked with the welfare and security of the population of a country<sup>23</sup>.



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<sup>23</sup> Nazneen Jabin, *Economic Impacts of Climate Change and Adaptation Policy in Malaysia*, Doctorate Thesis, Kuala Lumpur: Faculty of Economic and Administration, University of Malaysia, 2015, p. 1.

## CHAPTER I

### GLOBAL ENVIRONMENTAL ISSUES AND MIGRATION AS THE CHALLENGES OF TODAY

The primary impression of migration as a dilemma and as terminology on human mobility reflects on the multifaceted human population movements commenced by significant vulnerabilities of a person, a group of people, and affected communities. It consequently contrives severe and longstanding migration management challenges that can be regarded as a small or large scale array of migration. Though the correlation of climate change and migration has a bizarre complexity incorporating various environmental apprehensions, climate change in itself prompts the short-term migration process. More so, in the long run, may turn into a permanent form of human resettlement varying on the drastic transformations occurring in an environment.

Climate change over the succeeding decades will affect millions of lives and will force the human population to migrate and to seek refuge in other places<sup>24</sup> following the abrupt environmental changes accelerating the upshots of the increasing temperature, the enormous quantity of precipitation, severe droughts and flooding, and the rising sea-level due to the melting of glaciers<sup>25</sup>. With discernment that climate change is inevitable, environmental displacement too can be conceivable, which will materialize a new migratory arrangement.

It is imperative to say that migration also occurs in the context of environmental change where it increases vulnerability to already deteriorating ecosystem that drives migration<sup>26</sup>. Thus ominous estimations of millions of ‘environmental migrants’ or ‘climate refugees’ will arise in the future as the negative impact of climate change<sup>27</sup>. The migration crisis can be sudden or gradual from the

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<sup>24</sup> Frank Biermann & Ingrid Boas, “Climate Change and Human Migration: Towards a Global Governance System to Protect Climate Refugees, Climate Change, Human Security and Violent Conflict,” *Hexagon Series on Human and Environmental Security and Peace* 8, 2012, p. 291.

<sup>25</sup> Susan Martin, “Environmental Change and Migration,” Policy Brief, 2013, p. 1.

<sup>26</sup> The Government Office for Science, “Foresight: Migration and Global Environmental Change,” *Project Report*, London: Government of United Kingdom, 2011, p. 34.

<sup>27</sup> MICLE, Climate Change, Environment and Migration in the Sahel, 2012, p. 5.

start and can be fuelled by changes in the environment and human-made undertakings, which can mostly occur within a country or transnationally.

As a supplementary argument, socio-economic and socio-political considerations outline the silhouette of the profound connection of society and the environment. It elaborates on the extent of degradation the society is contributing to the ecosystem, such as industrial expansion, which in the long period results in climate change and other environment-induced disasters. With that said, these ecological events can translate to an insecure society – whenever a populace feels vulnerable in whatever aspect, they tend to seek sanctuary, subsequently forcing them to transfer elsewhere until they feel safeguarded socially and ecologically.

Migration and displacement, on the one hand, have definite delineation because both embrace resettlement yet varies from the individual's particular interest in relocating his/her habitual residence. Migration has various types; it can be more optional in the sense that the person who wishes to move still has alternatives such as pursuing economic opportunities while there are some forms of migration like political incited migration and environmental displacement constituting forceful population movement because it is generally a matter of life and death situation like, for instance, in some war-torn areas and disaster prone regions where people had to flee to save their lives. However, these two sequences of human resettlement share the same basis on environmentally instigated human movement, although it only diverges from their corresponding timelines since migration is undoubtedly gradual, and displacement is abrupt.

Environmental challenges and climate change and are, at this time and date, cause human migration. Under the umbrella of migration, environmental migration is one of its types which has its subset such as the climate refugees or climate migrations. These two subcategories are regarded to migrants who are involuntarily escaping from the rapid and continuing changes in climatic patterns in their local environment. Rising sea levels, extreme weather occasions, lengthy droughts and water insecurity are just several environmental setbacks that incite population movement.

## 1.1. Migration

Migration, as many scholars would argue, has been an effectual strategy in the whole history of humanity. Early civilizations can prove that the beginning of the ancient societies was a product of multiple blend of human movements driven by the impulse of survival until it was unambiguously subjected to multiplicity of motivations such as economic opportunities, political persecutions, social sways and environmental setbacks.

The collapse of the medieval societies accompanied by a transformation in the systems of revitalization, industrial revolution both commercial and agriculture, colonization, the emergence of free-market trading, contemporary education and scientific innovation are some of the most predominant elements influential to the expansion of migration<sup>28</sup>. Intersecting socio-economic, political and humanitarian disciplines assemble the light of interconnected principles and impressions of migration thus analytically stimulating the existing internal and external resettlement responses deliberating the contemporary cases of Europe, the Middle East and the Asia Pacific drawn in migration studies<sup>29</sup>.

With regards to Figure 1.1., the framework itself categorises the magnitudes of migration relevant to the existing migratory patterns anywhere in the world today. It goes to show that Micro or the personal level introduces spatial dealings in an individual level that commonly compacts personal point of view encircling a person's mobility drive with his/her standards, expectations and desires. Whilst Meso underscores how social entities can impact potential migrants to move considering their family, colleagues, and networks that encouraged them. It is something more than a personal aspiration, more of a team choice to realistically achieve the goals of the group. This somewhat valid to the migrant worker who tends to leave his home country to work in a foreign land to support his/her family. Cultural, political and

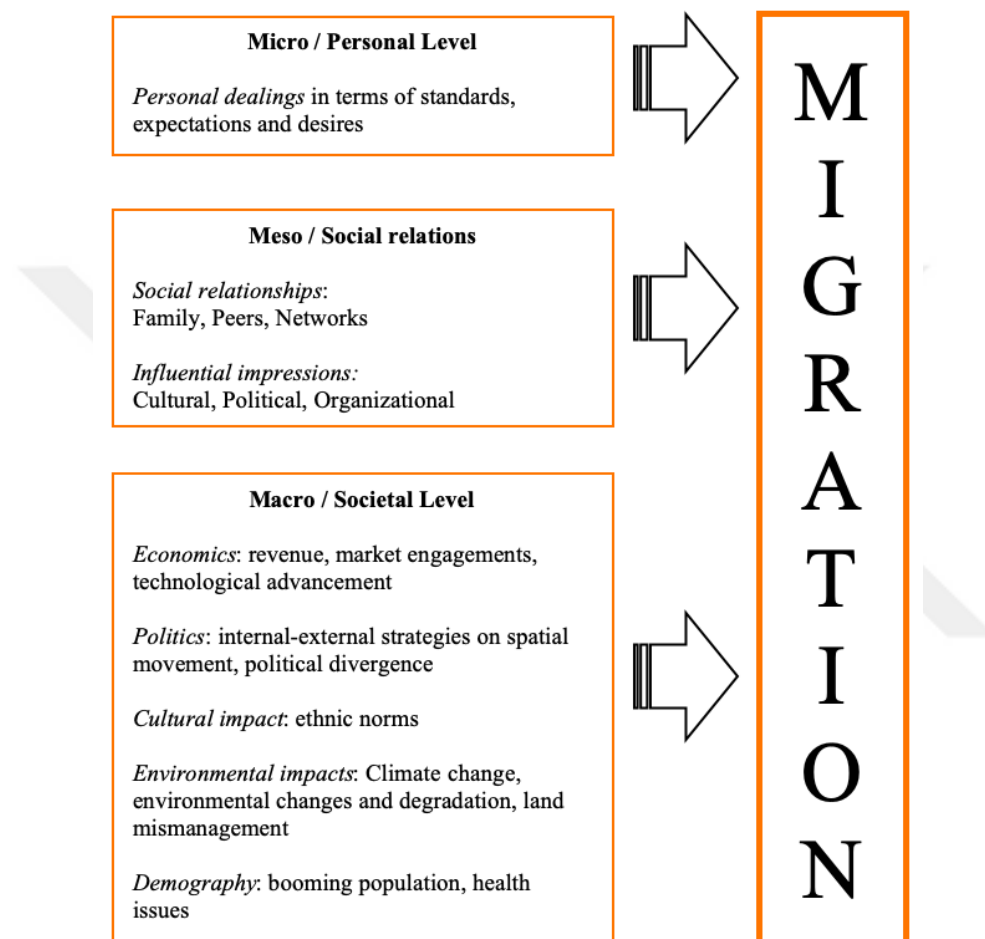
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<sup>28</sup> Aain Wickramasinghe, "International Migration and Migration Theories," *Social Affairs Journal* Vol. 1, Issue 5, 2016, p. 13.

<sup>29</sup> Marianna Karakaulaki, et al., "Critical Perspectives on Migration in the Twenty-First Century," *E-International Relations*, 2018, p. 2.

organizational undertakings also contribute as prominent impressions to any migrant reflecting the social impacts these collective entities craft in a society.

**Figure 1.1. Theoretical heights of migration models**



Source: This is a simplified illustration excerpt from the work of Olejárová<sup>30</sup> formulated from the profound insights of Faist<sup>31</sup>. The Author has modified some of the models and supplemented contemporary factors inciting spatial mobility like environmental changes and climate change.

Migration can be a means to drip poverty and as a root for social exclusion. Foreign money transfers can be instrumental in, as an example, to increase income, to

<sup>30</sup> see: Eva Olejárová, *Labor Migration as a Socio-Economic Phenomenon – Slovakia and the Czech Republic in A Comparative Perspective*, Thesis, Budapest: Central European University, 2007, p. 11.

<sup>31</sup> see: Thomas Faist. *The Volume and Dynamics of International Migration and Transnational Social Spaces*, New York: Oxford University Press, 2000, pp. 91-104.

support family and to increase capacities to alter socio-economic difficulties of a single household<sup>32</sup>. On a macro or societal level of spatial mobility, it is significantly the largest and most complex migratory model for migration. All authors who studied migration will agree that societal undertakings create collective impacts on migration. A strong economy and stable market activities, for instance, attract an influx of migrant workers from diverse places both internal and external. Technological innovation, too, draws human mobility because of living convenience compared to the poor quality of life from rural and other countries.

The basic foundations of why a person or group of people move lies on the complexity of migratory factors which are substantiated on socio-political, socio-economic, demographic, cultural, environmental, psychological and other related considerations<sup>33</sup>. On the neoclassical economics' take on migration, the labour market is the major driver of human movement considering the wages between countries whose economy is stable hence a household opts to dismiss financial risks by directing a family member to overcome financial constraints<sup>34</sup>. So, the optimal preference of governments to the "right" immigration strategies has a direct and substantial impact on economic undertakings for short term or even a longer<sup>35</sup>.

On the side note, the composition of the human population reiterates its bearing to human mobility triggered by the booming population<sup>36</sup>. In a more personal stance for migrants, the concentration of population in a definite place denotes the greater opportunity they can get if and only if they migrate—the rationale behind the rising population in urban cities. Insecurity incidence of community well-being where uncompromising communicable diseases are present can translate to a massive human movement which is understandably logical to save lives.

The emergence of climate change, environmental changes and other ecological destruction today that incite environmental migration is not a surprising circumstance

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<sup>32</sup> Saniye Dedeoğlu & Çisel Ekiz Gökmen, "Göç ve Sosyal Dışlanma: Türkiye'de Yabancı Göçmen Kadınlar," Ankara: Efil Yayınevi, 2011, pp. 15–33.

<sup>33</sup> Olejárová, *ibid*, p. 9.

<sup>34</sup> Douglas Massey, et al., "Theories of International Migration: A Review and Appraisal," *Population and Development Review*, Vol. 19, Issue 3, 1993, p. 432.

<sup>35</sup> George Borjas, "The Economics of Immigration," *Journal of Economic Literature* 17, 1994, p. 1668.

<sup>36</sup> Memet Zencirkıran, "Sosyoloji," Bursa: DORA Basım-Yayın Dağıtım Ltd. Şti, 2017, pp. 1–20.

anymore. Human activities greatly depend on natural capitals and when destroyed the society becomes insecure thus instigate a human population movement. However, environmental migration takes a slow progression varying from environmental issues but can likewise be sudden since natural undertakings are unpredictable.

The scholarship of human movement always demands an interdisciplinary approach of inputs from various spectrum such as political science, economics, sociology, geography, anthropology, and other related backgrounds. The studies of migration have concentrated solely on a distinct theme of migratory events relating to socio-economic considerations which are seen logical considering it produced millions of human mobility globally. Though the preceding decades, migration as a research premise was centered primarily on economic and social facets consequently established concepts running through the circles of socio-economic models. Environmental change causing environmental refugee and political unsteadiness prompting displacement from armed conflicted-areas appear to have moulded the latest migrant movements.

The total number of migrants as per Table 1.1., Asia has doubled contemplating the fluctuations from 1990 with 48.1 million and stretched to 79.5 million in 2017 whilst Europe increased from 49.2 million to 77.8 million employing the same time frame. Africa, on the one hand, has gained almost 9 million, Oceania has about 4 million increase whereas Latin America and the Caribbean has slightly got a rise of 2 million—all these extensive growths of migrants throughout the aforesaid regions happened in almost three decades. Asia and Europe accumulated the most number of international migrants since almost 79.5 million migrants are residing in Asia and Europe has approximately 77.8 million. Asia has the most number of international migrants followed by Europe, North America, Africa, Latin America, and the Caribbean then Oceania<sup>37</sup>.

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<sup>37</sup> UN, *Trends in International Migrant Stock: The 2017 revision*, 2017, Department of Economic and Social Affairs, date of access: 19 October 2019, [www.un.org/en/development/desa/population/migration/data/estimates2/data/UN\\_MigrantStockTotal\\_2017.xlsx](http://www.un.org/en/development/desa/population/migration/data/estimates2/data/UN_MigrantStockTotal_2017.xlsx)

**Table 1.1. International migrants from 1990 to 2017 discerning from the major region of origin to the area of destination**

Year	Asia	Africa	Europe	Latin America & the Caribbean	North America	Oceania
1990	48,108,431	15,690,623	49,232,191	7,169,728	27,610,542	4,730,858
1995	46,422,010	16,352,814	52,867,154	6,694,640	33,341,147	5,022,263
2000	49,198,332	14,800,306	56,314,416	6,579,328	40,351,848	5,360,027
2005	53,243,730	15,462,306	63,201,280	7,237,476	45,363,387	6,023,421
2010	65,921,788	17,007,249	70,747,947	8,246,652	50,970,996	7,124,634
2015	76,558,152	23,436,088	74,501,508	9,272,027	55,766,224	8,051,745
2017	79,586,709	24,650,223	77,895,217	9,508,189	57,664,154	8,410,933

Source: Ibid.

The data presented postulates the increasing migration from one region to region across the globe. The three-decade timeline here declares the immense growth of migration considering it is dated from 1990 to 2017<sup>38</sup>. Global population growth, economic development in most of the corners of the globe, technological advancement translating to the efficient mode of communication and transportation, proficient immigration policies and environmental changes relating to climate change have backed up the considerable flow of migration in all regions throughout the preceding decades up to now.

Fundamentally, with all the aforementioned statistics indicated, migration demands an expounded evaluation regarding its basis—on why it emerges. Understanding the profound significance of migration as a human phenomenon should also consider reviewing its causes which stand as its classifications based on the extraordinary benchmarks varying from each other. Each element diverges from the sort of human mobility's sources, intentions and motivations that notably relates to the incitement in terms of social, demography, political, economic, cultural, and environmental.

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<sup>38</sup> Ibid.

The push and pull dynamics behind human movements are discussed deliberately one after the other components to lay down the concrete pieces of evidence it demands to be studied. Push factor refers to the rationale of a person why he/she opts to move whilst pull factor adheres to the motivation enticing a potential migrant to move. These are the basic drivers of migration but seemingly a very composite topic.

### **1.1.2. Economic Migration in Rural-Urban and International Settings**

Economic migration has long been a motivation for population mobility which influences potential migrants to move from one region to another comprising cross-borders migration to seek for a better-quality of standard of life reflecting on the insufficiency of economic conditions and opportunities back in migrant's home region. Having mentioned that, the liberalization of the global trade that strained the opening of national markets and the lowering of taxes imposed for imported goods inflicted by the 'World Trade Organization or WTO' have organized economic-induced migration inciting rural-urban and transnational human movement.

Human mobility drawn by economic opportunities from one place to another, from country to country generates a category of migration often termed as economic migration. Economic migrants are people who cross borders to seek better economic possibilities to leverage their quality of living brought by greater job openings which the emigrants' home countries are lacking.

Increased economic development brings greater growth, which in the long run results in higher risks in the deterioration of the environment<sup>39</sup>. The conveyance of a strong labour market, the robust employment prospects and the upright conditions of the economy all present in one specific place can attract emigrants. Complimentary economic settings at the destination reflecting the outlook of higher wages, bigger employment prospects and capital investments influence human mobility<sup>40</sup>. The unflattering conditions of the migrants' home residences depict the fundamental

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<sup>39</sup> Esra Banu Sipahi & Erhan Örselli, "Çevre-İnsan İlişkisinde Yeni Değerlere Duyulan Gereksinim ve Çevre Etiği Yaklaşımları," *Değerler Bilançosu: Felsefe, Sosyoloji, Kamu, Eğitim, Çizgi Kitabevi*, 2015, pp. 165–190.

<sup>40</sup> WEF, "Migration and Its Impact on Cities," Insight Report, 2017, p. 15.

validations of their intention of why they are bound to move to withstand their livelihood.

**Table 1.2. The dynamics of economic migration's push and pull factors**

Push factor	Pull factor
<ul style="list-style-type: none"> <li>– Livelihood discontent</li> <li>– High poverty incidence</li> <li>– Scarcity of economic opportunity, e.g. occupation</li> <li>– Impractical occupation, i.e. the level of education is mismatched</li> </ul>	<ul style="list-style-type: none"> <li>– Greater economic chances, e.g. employment prospects, high demands for skilled worker</li> <li>– Capital generation, better wages</li> <li>– Technological advancement</li> <li>– Better quality of life</li> </ul>

Source: The Author has reflected the table from the works of Faist<sup>41</sup> and Olejárová<sup>42</sup> and has added contemporary dynamics that influence the push and pull factors on the economic side of migration arrangements.

As clarified in the Table 1.2., economic migration is identified as spatial mobility on a macro or societal level. Resilient economies generate huge labour prospects hence forming internal movement and beyond territorial borders thus creating an entry of emigrants. The dynamics of push and pull factors on economic migration explicitly illuminate the variabilities of economic-induced mobility. People migrate to make a living within their prospect of comfort labour enriching their standard of life.

Conversely, the palpable competition in the global market attracts skilled workforces and several countries have adopted immigration policies and strategies to favour talented foreign workers. The argument of skills become a scarce resulting in difficulty for firms to find competent workers from the domestic supply thus limiting the innovation and productivity the growth of the economy<sup>43</sup>.

<sup>41</sup> Faist, *ibid*, pp. 91–104.

<sup>42</sup> Olejárová, *ibid*, p. 11.

<sup>43</sup> Francesc Ortega & Chad Sparber, “Skilled immigrants: Economic contribution and policy implications,” *Refugees and Economic Migrants: Facts, policies and challenges*, 2016, p. 81.

Neoclassical theory assumes that prospect migrants maximize utility seeking a for the country of residence that maximizes the quality of their lives<sup>44</sup>. On another stance, the demand on labour force from foreign countries initiated migration, however, the migration system formed immigrant free enterprise and liberal informalization beyond the primary labour requirement of the economy<sup>45</sup>.

### 1.1.3. Political Migration

Migration as a subject matter advances significant and interesting normative inquiries regarding the legality of state power, the margins of political affiliation, and justice within and across state borders<sup>46</sup>. Conflict, prevalent human rights violations and other sources intimidating life and safety are a substantial drive to influence a migrant to leave his country of origin<sup>47</sup>. A political migrant often happens to an individual who, by force opted to move to another country to seek refuge from political intimidation or persecution, war conflict and the repudiation of a his political rights by the government of his home country.

Few years back and at present, the crisis that began to progress in 2015 as millions of Afghans, Syrians, Iraqis and Africans tried to cross the Mediterranean fleeing from war, political conflict, social injustice and poverty hereafter caught the attention of the world especially Europe<sup>48</sup> and the continuous escape of hundreds of thousands of refugees to Bangladesh from the political persecution in Myanmar.

In 2018, Turkey has been hosting 4 million refugees making the country home of the largest refugee population<sup>49</sup> while the case of political oppression in Myanmar has instigated 910,000 Ronghiyas to flee to Bangladesh to escape<sup>50</sup> and according to

<sup>44</sup> George Borjas, "Economic Theory and International Migration," *International Migration Review*, Vol. 8, Issue 3, 1989, p. 460.

<sup>45</sup> Ivan Light, "Globalisation and Migration Networks," *Immigrant Businesses The Economic, Political and Social Environment*, 2000, p. 165.

<sup>46</sup> Sarah Song, "Political Theories of Migration," *Annual Review of Political Science*, 2018, p. 386.

<sup>47</sup> IPU, Migration, human rights and governance, 2015, p. 17.

<sup>48</sup> Vincent Bernard, "Migration and Displacement: Humanity with its back to the wall, Migration and displacement," *International Review of the Red Cross*, Vol. 99, No. 904, 2017, p. 1.

<sup>49</sup> Muhammad Mussa, *Europe needs to learn from Turkey on hosting refugees*, 20 June 2019, date of access: 24 July 2019, [www.aa.com.tr/en/europe/-europe-needs-to-learn-from-turkey-on-hosting-refugees-/1510695](http://www.aa.com.tr/en/europe/-europe-needs-to-learn-from-turkey-on-hosting-refugees-/1510695)

<sup>50</sup> UNICEF, *Rohingya crisis*, n.d., date of access: 24 July 2019, [www.unicef.org/emergencies/rohingya-crisis](http://www.unicef.org/emergencies/rohingya-crisis)

the UN 2018 review 70.8 million individuals were forcibly displaced on a global scale as an outcome of persecution, conflict, violence and human rights abuse<sup>51</sup>. The dynamic correlation between migration and state violence goes back to the theoretical description of security that objectifies wide-ranging features of security for an individual or societal groups beyond the conventional constricted understanding of security from physical threat<sup>52</sup>.

**Table 1.3. The dynamics of political migration’s push and pull factors.**

Push factor	Pull factor
<ul style="list-style-type: none"> <li>– Political insecurity, i.e. political persecution, war conflict, human rights violation</li> <li>– Insufficient governmental services, e.g. healthcare, transport and education systems</li> </ul>	<ul style="list-style-type: none"> <li>– Independence and socio-political freedom, i.e. reinstatement of basic human rights</li> <li>– Safety and security reassurance</li> <li>– Access to better governmental services</li> </ul>

Source: European Asylum Support Office, *The Push and Pull Factors of Asylum Related Migration A Literature Review*, Luxembourg: Publications Office of the European Union, 2016, pp. 23–25.

Political insecurity, as enumerated in the Table 1.3., has brought people to flee because of oppression, political conflicts such as war and human rights violations. So does insufficiency of services coming from the government can impact people since the total absence of comfort makes them choose a better place to live meeting the standard set. Government services as a push factor instigating political migration relate within the bearing of political perspective because the government itself functions on a societal spectrum thus operating to assist the citizenry carrying through strategies and policy implementation.

<sup>51</sup> UNHCR, “Global Trends: Forced Displacement in 2018,” 2018, p. 1.

<sup>52</sup> Andre Bank, et al., “The Political Dynamics of Human Mobility: Migration out of, as and into Violence,” *Global Policy*, Vol. 8, Issue 1, 2016, p. 13.

What makes a potential refugee or migrant want to move is the basis of access to independence connoting socio-political liberty by the reinstatement of his basic human rights that were dismissed by his country of origin. Safety and security also is a great manifestation for a prospect motivation for anyone to think before entering the process of migration. Lastly, having mentioned insufficient governmental services as a push factor for political migration, on the lens of a pull factor, that too can be a driver of human movement attracting migrants of a better means of the quality of living ensuring all aspects of security reflecting improved governmental assistance.

IOM reiterated that, a state may grant ‘asylum seeker/s’ protection on its territory to individual or group of people outside their country of nationality and of residence because of persecution, intimidation to their lives and other considerable motivations. Not all asylum seeker will eventually be acknowledged as a ‘refugee,’ however, all acknowledged refugee is primarily considered an asylum seeker<sup>53</sup>. Asylum requires a wide range of factors involving non-refoulement, permission to stay in the asylum state, humane treatment conditions, and finally a permanent alternative.

#### **1.1.4. Social Migration**

As illustrated in Figure 1.1. (refer to page 13), social entities pose a great influence to migrants when it comes to various personal and societal considerations from family relations, occupational colleagues, networks and organizations. Social migration is often within the bounds of personal intentions and can be beyond personal objectives bearing in definite choice/decision of a group to intently realize the goals set.

On a more sensible standpoint establishing on the elaborated factors on the Table 1.4., this aims to rationalise the validity of an emigrant’s conclusion leaving his/her home country to look for a job in a foreign land, earn sufficient capital and support his/her family. Cultural, political and organizational activities are also seen as instrumental to the mobility of potential migrants reflecting on societal bearings these entities postulate in every community.

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<sup>53</sup> IOM, *ibid*, p. 11.

**Table 1.4. The dynamics of social migration's push and pull factors**

Push factor	Pull factor
<ul style="list-style-type: none"> <li>– Social insecurity, i.e. livelihood (poverty), healthcare, transport and education systems</li> <li>– Social relations, e.g. family reunification &amp; obligation, influence from peers, culture, networks, etc.</li> </ul>	<ul style="list-style-type: none"> <li>– Better opportunities</li> <li>– Better social services, security reassurance</li> <li>– Reintegration, i.e. family affairs, obligation from family, peers, organizations, etc.</li> </ul>

Source: European Asylum Support Office, *ibid*, pp. 23–25.

Poverty is a societal dilemma that has long been branded as the foremost cause of migration. Correspondingly, it is only natural that there is an emergent interest in the correlation between poverty and migration. However, migrants are often not adherent to the poorest population strata if taken to contemplation the totality of human, social and financial needs a single individual needs to have to transport across international borders<sup>54</sup>. The absence of livelihood and extreme poverty can emphasize a motivation of economic migration since it somehow a response to curb the crisis for most migrants, a strategy for many people especially people from developing countries with high incidents of poverty rate like the case of Philippines, where most migrants workers come from.

Notably, the fallout of human population movements to poverty can help lighten its incidence if taken into account the immigrant's intent to support his/her family back home by sending them financial funding, nonetheless, can also adversely escalate poverty consequences since most immigrant workers practice this norm thus affecting the lives of the people and the economy of the country — opportunities are seen being robbed by the immigrants from the locals.

Identical with the cited political migration push factors (see page 28), better-quality implementation of social welfare programs in most developed countries

<sup>54</sup> UN, *Conference News: Social Policy and Migration*, Stockholm: UN Research Institute for Social Development, 2007, p. 3.

encourage migration<sup>55</sup>. Improved social policies capable of providing improved quality of life can boost migrant to transfer since it does promote abundant opportunities and relevant beginnings for most people.

### **1.1.5. Environmental Migration**

Environmental migration is an emerging brand of human population movement pattern instigated by abrupt or permanent changes on the local environment of a populace hence obligated to migrate to another place be it in the form of transboundary or internal migration. The ecologically incited migration crisis is feasibly one of the upshots of climate change.

Based on the Table 1.5., environmental insecurity is reflected as an alarming problem globally. Here, security indicates the dependability of the humankind on natural resources where all the practical needs for every human activity truly come from. The intensive usage and consumption of natural assets would viably end to the spur of an insecure society where food, water, and other human basic needs are limited of supply since the level of ecological production is already inadequate.

‘Environmental migrant’ indicates a person or group of the population who moves from their place of origin to another due to the continuing and sudden change in their local environment that torment their living conditions. It is assumed to either put in place a temporary or permanent resettlement arrangement leaving their habitual residence to move within its country’s boundaries or externally<sup>56</sup>.

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<sup>55</sup> Anja Rudiger & Sarah Spencer, *Social Integration of Migrants and Ethnic Minorities Policies to Combat Discrimination*, Brussels: The European Commission and OECD, 2003, p. 9.

<sup>56</sup> IOM, *ibid*, p. 63.

**Table 1.5. The dynamics of environmental migration’s push and pull factors**

<b>Push factor</b>	<b>Pull factor</b>
<ul style="list-style-type: none"> <li>– Climate change (rising temperature, severe rainfall, sea-level rise, extreme natural disasters, etc.)</li> <li>– Environmentally insecure (environmental degradation, declining natural capitals, deforestation, etc.)</li> <li>– Food and water insecurity</li> </ul>	<ul style="list-style-type: none"> <li>– Resilient habitation</li> <li>– Availability of livelihood (food secure, etc.)</li> <li>– Environmentally secure</li> </ul>

Source: European Asylum Support Office, *ibid*, p. 28.

Climate change cannot essentially construct a distinct category of migration, but rather can be projected to interplay with other origins of human settlement, it can feasibly influence existing migratory patterns. There are a series of distinctive and intermingled factors which the environment is one that concludes migration<sup>57</sup>. And accordingly, the International Organization for Migration expounded the idea of ‘migration crisis’ a complex term that generally pronounces huge range of migration movements and mobility arrangements triggered by a disaster typically entangled substantial vulnerabilities to a single individual down to a group of people or a community. A migratory crisis may be abrupt or gradual in the beginning, can be instigated by natural or man-made origins, and can take place internally or across borders<sup>58</sup>. Although the concept of the environment seems to be clear and easily logical at first glance, it turns out that as the concept itself is so complex, its scope is broad and its boundaries are difficult to pull off<sup>59</sup> hence the unpleasantly of natural phenomena.

<sup>57</sup> ADB, *ibid*, pp. 2–6.

<sup>58</sup> IOM, *ibid*. *IOM Migration Crisis Operational Framework*, 2012, p. 1.

<sup>59</sup> Ruşen Keleş, Can Hamamcı & Aykut Çoban, “Çevre Politikası,” Ankara: İmge Kitabevi, Vol. 8, 2015, p. 32.

Resilient habitation can initiate a gradual dwelling of a population from a place susceptible to environmental changes brought by climate change and in no time can attract great movement of people to seek for a sanctuary to settle in. Convenience in making a livelihood is another factor that pulls potential migrants taking into consideration environmental security.

In addition, the swift changes in the environment and the escalation of intensities of natural disasters have always triggered migration. With climate change, it is anticipated that more population movements will arise, considering the vulnerabilities from extreme climate patterns and the severity of natural disasters in the 21st century. Climate change triggers lengthy droughts, massive precipitation discharges, and increasing temperatures, which are becoming more frequent due to climate change. Therefore, it affects local livelihoods such as food production industries that add up to the issue of food insecurity, obliterating infrastructures, impairing economies, and etcetera.

The movement of people is perceived to be continuing because of the impacts of natural disasters, and the degradation of the environment and climate change is a plus to the emergence of human mobility. Hence, environmentally-incited population mobility has many composite forms; it may be forced and intentional, temporary, and permanent, and can be both internal and cross-border or transnational. The impression of “exposure” is the center of the existing and forthcoming reactions to environmental migration. The higher the exposure in vulnerable regions would mean the higher the chances of incapacity to protect a community from extreme natural weather events, environmentally insecure comprising both food and water resources and the like.

#### **1.1.6.1. Extreme Natural Disasters**

Environmental disasters are repeatedly reflected as an imperative driver of migration. Somewhat, constructing on the historical verification, it goes to confirm that its relationship cannot be categorized as new since it perhaps occurred from the

beginning of human history<sup>60</sup>. Natural disasters may initiate migratory movements out of disturbed places. This migratory scenario can be projected in regions where the natural disaster has caused social and economic destruction in its wake<sup>61</sup>.

In 2018, it was estimated that 17.2 million people from 144 countries were displaced because of disasters. Over the period eleven years, from 2008 to 2018, it is recorded on a global-scale that about 265.3 million people were significantly affected by disasters, thus opted to move internally as a response according to ‘The Internal Displacement Monitoring Center (IDMC)’. The Philippines, China, and India were documented as having the highest numbers of disaster displacements in 2018. Extreme weather events like storms have caused displacement of 9.3 million people, while 7.9 million displacements were instigated by cyclones, hurricanes, and typhoons<sup>62</sup>.

Climate change and natural disasters instigate people to migrate considering there are no complementary mitigation approaches to employ, then strained to move because of the environmental turmoil and probably can have enough funds for the migration costs<sup>63</sup>. Environmental turmoil adheres to the variances of stern natural dealings such as volcanic eruption, floods, landslides, droughts, tropical storms, rising temperatures, wildfires, droughts, and etcetera, some of these are stirred by climate change. Nevertheless, these environmental reactions or natural disaster incidences through time seem to have escalated the leanings of environmental migration.

#### **1.1.6.2. Food and water insecurity**

Food security is similarly consequential to the reassurance food production systems and the availability of food in everyone's table regardless of social status. It likewise adheres to sustainable food production systems that safeguard sufficient food supply concerning the distribution and accessibility of food products in the market for

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<sup>60</sup> Linguère Mously Mbaye & Klaus F. Zimmermann, *Environmental Disasters and Migration*, Discussion Paper, Bonn, Germany: Forschungsinstitut zur Zukunft der Arbeit Institute for the Study of Labor, 2015, p. 2.

<sup>61</sup> IOM, “Migration, Development and Natural Disasters: Insights from the Indian Ocean Tsunami,” *IOM Migration Research Series*, 2007, p. 8.

<sup>62</sup> Migration Date Portal, *Environmental Migration*, 2019, date of access: 30 July 2019, [migrationdataportal.org/themes/environmental\\_migration](https://migrationdataportal.org/themes/environmental_migration)

<sup>63</sup> Linguère Mously Mbaye, “Climate change, natural disasters, and migration,” *IZA World of Labor 2017*, 2017, p. 1.

consumers upholding its unrestricted access. With that being said, significant economies in the world profoundly depend on the agriculture industry. The threat climate change has brought in reality, poses a remarkable setback to food security, especially to small-scale farmers in several developing countries because it incites unpredictable weather conditions such as intensifying temperature and heavy rainfall.

Water security, too, is parallel to food security as it has an immense bearing on food production systems. More logically, water in itself is the very foundation of human life since it is the primary source of living organisms, such as plants, animals, and the ecosystem in general. The very essence of water in the agriculture industry is that it ensures the supply of food supply by catering water system through irrigation and rainfall as natural means. However, climate change and environmental destruction stimulate insecurity to water systems, to the agriculture industry, and the whole systems of food production.

Water dearth is historically and geographically a reality several countries have endured, particularly during the dry season and in times of El Niño but can also be a conclusion of flawed policies and management dealings. Water governance likely remains to be relevant today; thus, accurate management dealings for both natural and human-made induced water challenges can, in return, achieve economic, social, and environmental development and security<sup>64</sup>. Climate irregularity concerning the rapid change in temperature and hydrology has a significant impact on water security in the country and anywhere globally.

Fundamentally, food security along with water security deem to create sustainable systems that reassure the availability of food for future consumptions. However, its insecurity can initiate future population movement because hunger drives a local populace to look for better opportunities externally when they reckon their local environment is no longer capacitated to provide their basic needs like food and water.

On a serious note, food security, including water security, has a direct relationship with migration. Well, naturally, when people do not see practical reasons to stay in their locality because of hunger, they tend to migrate to escape food

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<sup>64</sup> ADB, Asian Water Development Outlook 2013: Measuring water security in Asia and the Pacific, Mandaluyong: ADB, 2013, pp. 2–5.

deprivation. The interrelationship between agriculture, food security, and migration can draw an incidental case to survive income uncertainties and the likelihood of food insecurity<sup>65</sup>. Migration has been influenced by the structure of the human population, the socio-political and socio-economic considerations, and numerous environmental dealings, which all are the main agitations for poverty, natural disasters, agricultural undertakings, and food security.

#### **1.1.6.2. Environmental Degradation**

The deterioration in the environment is evident in all corners of the world as a disturbing concern. Hence, the impacts of ecological destruction can pose tremendous vulnerability and risk to either national, regional, or global security. In a more conventional stance, security involves state sovereignty and defense from internal and external human-made risks. Nevertheless, time shaped its social impression when environmental disturbances of all types became a threat to humankind. Environmental security in the global milieu has long been a concern since the global market's significant economic growth largely depends on minerals, agriculture, forestry, aquatic resources, and etcetera.

Over time, there has been a massive depletion of natural resources because of continuing industrialization, rapid population growth, and continuing activities that degrade the environment have critically contributed to the ecological insecurity of anywhere in the world. On a more thoughtful stance, when the environment deteriorates, it can directly instigate insecurity both in water and food production, thus can activate migration arrangements in a local setting. People tend to move to places they know they are socio-environmentally secure, not to mention the reassurance of their livelihood.

The abrupt alteration of climate may force a particular group of population to move to another region and abandon their homes, for there is the inadequacy of their necessities. It has long been the justification of the background of environmental politics and continuously remains to be the pivot of international diplomacy nowadays.

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<sup>65</sup> UN FAO, IFAD, IOM & WFP, *The Linkages between Migration, Agriculture, Food Security and Rural Development*, Rome: UN FAO, 2018, p. 80.

## 1.2. Climate Change and its consequences

Greenhouse gas products such as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrogen dioxide (N<sub>2</sub>O) and an increase in the concentrations of these gases in the Earth's atmosphere triggered the rise in the extent of the heat from the sun which is supposedly be discharged back into space<sup>66</sup>. Industrial Revolution initiated the consumption of fossil fuels, thus increasing the concentrations of carbon dioxide by 40%, with a more significant increase occurred since 1970, and the global temperature since 1900 has risen by about 0.8°C or 1.4 °F<sup>67</sup>.

The alterations in land use are another means of inducing the change in the planet's climate. It is claimed that 10% to 20% of excess carbon dioxide is emitted each year, and deforestation is the one responsible for it, not to mention agriculture too contributes methane and nitrous oxide<sup>68</sup>. Persistent fossil fuel-driven development can make the planet 4.9°C warmer in 2100, and a 0.5-meter sea-level rise is likely to transpire if climate change continues<sup>69</sup>. This climate stance poses an inordinate collision to every economy in the world hammering the economies of many developing countries particularly in the region of Southeast Asia and the Middle East.

There is an underlying climate-economy relationship. Climate change can substantially widen the range of income gaps amongst rich and developing countries that numerous developing countries are pushed toward extreme poverty<sup>70</sup>. The outcomes of climate change that have been calculated and monetized involve the climate-waves on agriculture and forestry, water assets, coastal regions, energy

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<sup>66</sup> UFCCC, *Climate Change: Impacts, Vulnerabilities and Adaptation in Developing Countries*, 2007, p. 8.

<sup>67</sup> Royal Society & US National Academy of Sciences, "Climate Change Evidence & Causes," *An overview from the Royal Society and the US National Academy of Sciences*, 2014, p. 2.

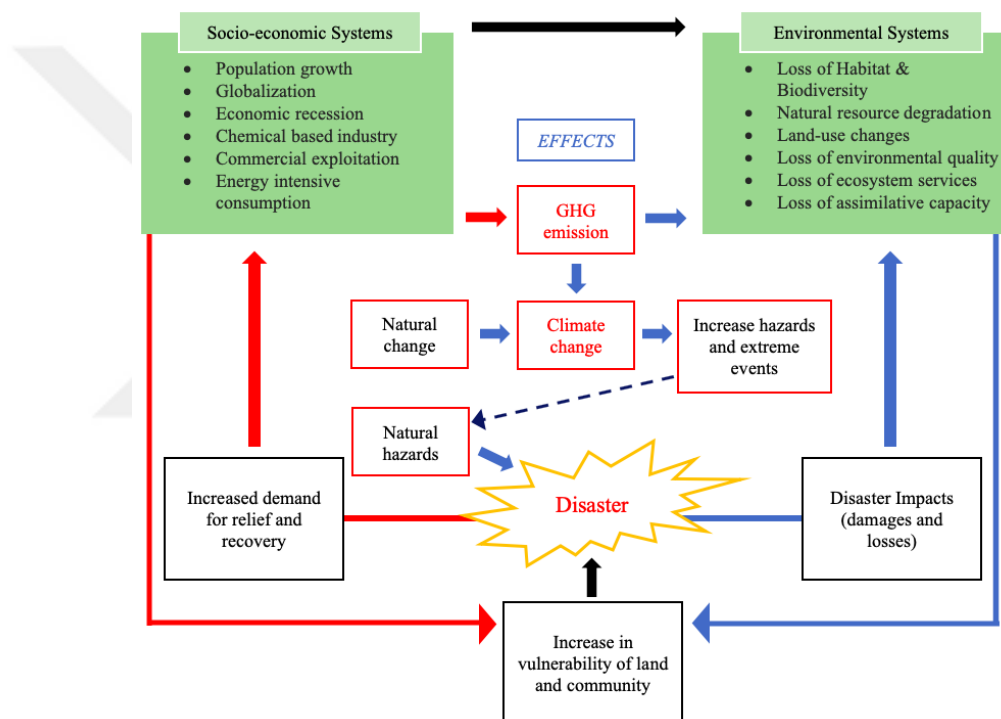
<sup>68</sup> NRC, *Climate Change: Evidence, Impacts and Choices*, Washington DC: The National Academies Press, 2012, p. 9.

<sup>69</sup> Alexander Pfeiffer & Cameron Hepburn, "Facing the Challenge of Climate Change," *Global Journal of Emerging Market Economies*, 2016, p. 204.

<sup>70</sup> Melissa Dell, Benjamin Jones & Benjamin Olken, *Climate Change and Economic Growth: Evidence from the last half century*, Working Paper, National Bureau of Economic Research. Massachusetts: NBER, 2008, p. 27.

utilization, air quality, and human wellbeing<sup>71</sup>. Conversely, the higher the temperature gets, the lesser the production yields that could give an immediate conclusion to the decrease of GDP, resulting in socio-political instability especially in developing countries where economic system is poor and that is seen being exacerbated by climate change.

**Figure 1.2. Interaction between socio-economic, environmental systems and disasters**



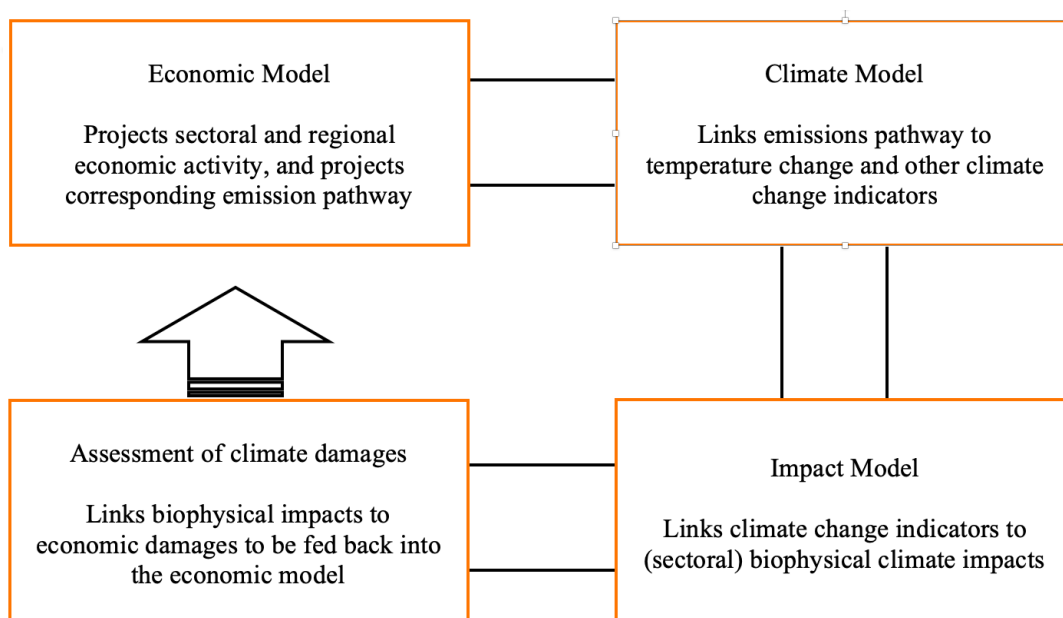
Source: Anil K. Gupta & Sreeja S. Nair, *Environmental Extremes Disaster Risk Management: Addressing Climate Change*, New Delhi: National Institute of Disaster Management, 2012, p. 17.

Conceivable bearings of the rapid alteration of climate on the socio-economic systems and environmental systems are perceived relating to the exposure of both systems and the mitigation and adaptability mechanisms present thereof. The extent of impact climate change can bring to these underlying systems varies from the counter mitigation and adaptation measures a community performs.

<sup>71</sup> Richard Tol, "The Economic Effects of Climate Change," *The Journal of Economic Perspectives* Vol. 23, Issue 2, 2009, p. 41.

All-Encompassing socio-economic activities create a remarkable fallout to the environment. When greenhouse gas escalates, it increases its carbon footprint that builds a threat to biodiversity, triggers climate change, and then later on increases the intensities of disasters. With the tendencies of extreme disastrous events, it impacts loss and damages to both systems, environmental and socio-political, therefore increasing the requirement for relief and recovery strategies.

**Figure 1.3. Linking economic and climate change models**



Source: A revised version of the links of models of the economy and climate change. See: Stéphane Hallegatte, Fanny Henriët and Jan Corfee-Morlot, “The Economics of Climate Change Impacts and Policy Benefits at City Scale: A Conceptual Framework,” *OECD Environment Working Papers*, No. 4, OECD Publishing, 2008, p. 10.

In Figure 1.3., demonstrating climate destruction using models exemplified by the OECD draw the magnitude of economic activity responsive to the adaptation to the damages that are seen integral that is relatively visible in this illustration. Each model, with its corresponding activities, itemizes the particularity of the conclusions relating to the fallout of climate change to the economy. As for the first model, the economy delivers the complexity of market production encompassing the systems of

industrial operations that generally emits an enormous amount of carbon dioxide (CO<sub>2</sub>) responsible for the second phase of the models, which is the climate. The climate model specifically triggers environmental alteration, such as escalating temperature and precipitation plus the augmentation of drought and flooding incidents and other climate-instigated calamities.

Hereafter, the impact model as the third segment of the illustration takes place by connecting the entire bearing the climate change stimulates to biophysics that interprets the powerful effect of climate in the ecosystem and the human population. The aftermath of climate-induced impacts will be evaluated on the degree of damage it brought biophysically, which also has a direct bearing on the economy because the economy itself largely depends on the components of biophysics. The last model establishes a crucial part in formulating mitigation in climate-induced dilemmas through adaptation of policies enhancing economic practices fostering less emission of greenhouse gasses to lessen the impacts of climate change.

Furthermore, it is therefore clear that climate change has a profound impact on agriculture and ecological settings, which local farmers and rural inhabitants have to dwell on. Local communities have to adopt climate-resilient strategies relevant to their agricultural practices, environmental management dealing with their natural capitals and security of food production<sup>72</sup> About that, the emergence of climate change and its effects, too, pose a multi-layered problem that disturbs food systems regardless of the place of production, whether it is produced in a developed or developing country since climate change as a phenomenon prefers no place to distress<sup>73</sup>.

Small scale and landless farmers especially in developing countries are the most affected sector considering their inability to elevate themselves from the sustenance of living, incapacitated to continue their livelihood because of financial difficulties and undermined to proceed agricultural activities due to the limited information farmers possess to combat the outcomes of climate change.

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<sup>72</sup> Cees Leeuwis & Andy Hall, "Facing the Challenges of Climate Change and Food Security," 2013, p. 2.

<sup>73</sup> Canagasaby Devendra, "Climate Change Threats and Effects: Challenges for Agriculture and Food Security," *Series on Climate Change*, 2012, p. 5.

It is essential to discuss that aiming for the agricultural industry to prosper. The industry has to acclimate, modify, and adjust its practices to the conceivable risks of climate change to balance the biodiversity at large. Augmented and empathetic understanding of the climate issues is quite crucial to capacitate the agricultural players to adapt and manage resiliency that can, therefore, support the ecosystem to secure food production.

Third world countries, on the serious note, are experiencing the severest blow of the impacts of the altering of climate. Tropical Storms such as Haiyan labeled as one of the most potent super typhoons that ever hit the Philippines had claimed thousands of lives and generated billions of dollars total damage. This given scenario only goes to illustrate how climate change can critically be fatal and can obstruct development in any country.

Climate change is dubbed as one of the sternest environmental challenges the Earth is confronting today. The planet is suffering from a substantial and augmented alteration of climatic conditions that started over centuries ago<sup>74</sup>. The urgency of the climate crisis made the former United Nation's Secretary-General Ban Ki-moon pronounce the significant risks of climate change in human history because it intimidates the continuity of human existence<sup>75</sup>. On a side note, the Climate Reality Project, established by Al Gore, is a global initiative delivering trainings and programmes on climate science to involved individuals in learning about climate change. It held 23 trainings since 2007 and still continuing in several across the globe<sup>76</sup>.

In 2015, the United Nations, with the participation of 195 countries who crafted the political framework for climate action by accepting the 2030 Agenda aiming for "Sustainable Development Goals or SDG" and the Paris Climate Agreement. A quite identical rationale why the Intergovernmental Panel on Climate Change is instituted

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<sup>74</sup> EU, *Our planet, our future Fighting climate change together*, Luxembourg: Imprimerie Centrale, 2018, p. 3.

<sup>75</sup> FMECD, "Climate change – Time to act | Climate policy in the context of the 2030 Agenda," 2016, p. 6.

<sup>76</sup> Zerrin Savaşan, *Climate Change: Taking Action for a Better Future*, 09 February 2014, date of access: 09 February 2020, [www.strategicoutlook.org/philosophy/news-climate-change-taking-action-for-a-better-future.html](http://www.strategicoutlook.org/philosophy/news-climate-change-taking-action-for-a-better-future.html)

to practically assist the partaking governments in taking action to safeguard the planet from climate change-induced fallout.

Government bodies, international organizations, and media from around the globe have been paying significant attention to climate change, but various concerns are not understood. It is imperative to say that experts in the field of meteorology, hydrology, and oceanography are discerned knowledgeable with this complex topic to oversee the climate conditions and incorporate its perspectives to action plans assisting governing bodies to understand the root cause of the climate problem<sup>77</sup>.

Mitigating climate change is believed to be the foremost concern of humanity to date because it is a now-or-never chance to save the planet from global warming. Though the climate mitigation efforts remain to be challenging to deliver in creating a universal solution because most of the economies rely on the industries emitting greenhouse gasses and it sort of an indispensable and a skeptical move to give it up.

### **1.2.1. Climate refugees**

Climate refugee in a logical framework is equivalent to environmental migrants but only differs from its usage and perspective. Climate refugee stands on the context set by climate change while environmental migrant connotes a largescale bearing of environmental changes such as degradation, deterioration, and destruction of the environment incorporating the effects of climate change which in the long run both conclude human resettlement. Nonetheless, environmental problems cause new conflicts and tensions in the international and global level due to the transboundary landscape, while forcing countries to act together, and making them both in conflict and even in conflict with each other<sup>78</sup>.

Climate change-induced migration now branded as climate refugee surmises the need for interference of political dialogue among all sectors of the society, especially the governments to design policy propositions should climate change continue to draw migration since it is virtually an unrelenting phenomenon. The

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<sup>77</sup> WMO, *Introduction to Climate Change*, Ed. David Houghton, Geneva: WMO Technical Publications, 2002, p. 1.

<sup>78</sup> Esra Banu Sipahi & Segah Tekin, "Akdeniz'de İklim Değişliği ve Çevresel Güvensizlik Kıskaçında İklim Mültecileri," *Akdeniz'de Çevresel Güvenlik*, 2016, pp. 44–78.

emergence of climate refugees has laid in the table the urgency it demands to be discussed in the global political sphere. Climate refugee, as particularized by the UNHCR, is considerably not acknowledged in the definition of a being a “refugee.” In line with the terminology “refugee,” the 1951 ‘Refugee Convention’ as amended in the 1967 Protocol Relating to the Status of Refugees defines the term as:

*“A person who is owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country; or who, not having a nationality and being outside the country of his former habitual residence as a result of such events, is unable or, owing to such fear, is unwilling to return to it”<sup>79</sup>.*”

The delineation stated in the convention restricts coverage to those persecuted for their beliefs and association with a specific group. It does not stand to cover climate refugees since climate change is, in an ordinary sense, not labelled as persecution though it is of human origin<sup>80</sup>. However, the IOM itself has particularized that “Environmentally Displaced Person (EDP),” a person who is displaced within his/her country of residence or had crossed international borders because of environmental calamities. A specified term used as a less contentious substitute for environmental and climate refugees<sup>81</sup>.

Apparently, the rising number of environmentally displaced people has significantly observed in sub-Saharan Africa. Several countries such as Yemen, China, Louisiana, Tuvalu, Kiribati, and Bangladesh are documented at high risk of environmental displacements<sup>82</sup>; Water crisis in Yemen<sup>83</sup>, increasing desertification in

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<sup>79</sup> UNHCR, *The 1951 Convention Relating to the Status of Refugees*, 1951, p. 14.

<sup>80</sup> Kasia Snyder, Theodor Rathgeber & Stephen Humphreys, “Protection and Reparations for ‘Climate Refugees’: Imperatives and Option.” *Climate Refugees: People Displaced by Climate Change and the Role of the Churches*, 2013, p. 8.

<sup>81</sup> IOM, *Migration, Environment and Climate Change: Evidence for Policy (MECLEP)*, 2014, p. 13.

<sup>82</sup> Petra Ďurková, et al., *Climate refugees in the 21st century*, Regional Academy on the United Nations, 2012, pp. 4-5.

<sup>83</sup> Nicole Glass, “The Water Crisis in Yemen: Causes, Consequences and Solutions,” *Global Majority E-Journal*, Vol. 1, Issue 1, 2010, p. 17.

the Gobi in China<sup>84</sup>, sea-level rise in Louisiana<sup>85</sup>, Tuvalu, Kiribati and Nauru are experiencing land loss due to incremental rising sea level due to incremental rising sea level<sup>86</sup>, and with the same events, Bangladesh might also lose one-fifth of its surface area<sup>87</sup>.

Appalling estimates suggest that forced environmental migration may likewise transpire in other parts of the world i.e., in Morocco, Tunisia, Libya, Egypt, Turkey, Vietnam, Niger, Ghana, Ecuador, Mexico, Argentina and etcetera<sup>88</sup>.

Mass population displacement has a higher chance of befall with the consequences brought by climate change. A daunting and one of the most steadfast concerns vulnerable countries, especially small island states like Tuvalu, Kiribati, and Nauru, have to face land loss due to the rising sea-level that is undeniably existent. Mass migratory movement can signify fiasco of governmental policy interventions at the international and national levels involving local involvement offsetting the results of climate change.

### **1.2.2. Climate Change and Environmental Migration affecting Politics and Societies**

The environment began to become an international priority for scholarly analysis after the Cold War since scholars are relatively concerned about the issues of pollution, conservation, and natural resources. In a more particular manner, logical dilemmas are encircling the international system concerning environmental pressure on the models of governance, institutions, agencies, knowledge, and norms<sup>89</sup>.

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<sup>84</sup> Troy Sternberg, Henri Rueff, & Nick Middleton, "Contraction of the Gobi Desert, 2000–2012," *Remote Sensing*, Vol. 7, 2015, p. 1346.

<sup>85</sup> Ben Strauss, et al., *Louisiana and the Surging Sea: A vulnerability assessment with projections for sea level rise and coastal flood risk*, 2015, p. 13.

<sup>86</sup> UN-UIEHC, *Climate Change and Migration in the Pacific: Links, attitudes, and future scenarios in Nauru, Tuvalu, and Kiribati*, Bonn: UN Escap, 2017, p. 1.

<sup>87</sup> Cansu Karsili, et al., "Sea-Level Extremes and Change-Example of Bangladesh," *International Conference on Mechanical, Industrial and Materials Engineering*, 2013, p. 1.

<sup>88</sup> Lewis W. Marshall, et al., "Toward a new definition of 'refugee': is the 1951 convention out of date?," *European Journal of Trauma and Emergency Surgery*, Vol. 37, 2011, pp. 61–66.

<sup>89</sup> Simon Dalby, "Environment and International Politics: Linking Humanity and Nature," *Environment, Climate Change and International Relations*, 2016, p. 42.

The environment has become a fundamental factor in international relations with the intensifying dilemmas brought by climate change, a sensitive environmental problem requesting for a diplomatic action being seen as a relevant concern anywhere in the globe today. The threat of rising seas, desertification, variable amount of rainfall, instability of food production and water supply, emergent migration prompted by ecological changes, are ascending ecological mayhems trailblazing the centrality of global politics.

Climate change has a largescale effect relating to human actions, may it be in cultural, social, economic, and even political. The variations in the climate can nonetheless modify several circumstances that humankind undertakes. Climate systems, to be particular, are a substantial natural occurrence in making human action a reality hence the dependability of human societies from the vast natural systems to survive.

On a theoretical take of Aristotle as conveyed by Gerring, it is elaborated that the idea of the plural vision of causation is apportioned onto 4 categories: (a) *formal causes*, an effect is created, therefore causative to its substance; (b) *material causes*, the material out of which an effect is architected; (c) *efficient causes*, the calculated dynamism which helped surface an impact; and (d) *final causes*, the commitment for which a result was created<sup>90</sup>. The conception that everything comes from a cause is then maybe to some extent redirect the self-understanding of a most self-conscious society that only sees development. The analysis clarifies that causal relations belong to the circle of human actions<sup>91</sup>.

Having particularized these practical logics, these types of causation models expose the close correlation between the natural sciences and social sciences basically to emulate the systematic method of the latter in investigating a social phenomenon as well as integrating natural disciplines to the fundamentals of social sciences.

In relation, political actions are rationally driven by active coherent causes anchored with societal complications in all sorts that demand resolution. Climate

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<sup>90</sup> John Gerring, "Causation: A Unified Framework for the Social Sciences," *Journal of Theoretical Politics*, Vol. 17, Issue 2, 2005, p. 163.

<sup>91</sup> Sverre Wide, "Causation and reason: R. G. Collingwood and causal analysis as the essence of social thinking," *Distinktion: Journal of Social Theory*, Vol. 18, Issue 2, 2017, pp. 187–190.

change and environmentally-incited migration may imply co-occurring conditions considered to be first-hand in the context of socio-political systems and the relationship between the ecosystem and society<sup>92</sup>. Additionally, environmental destruction and the augmented consumption of natural capitals have produced common glitches such as mass migrations as well as domestic and international conflict<sup>93</sup>. The effects of these environmental changes will upset social and political affairs, promoting societal insecurity.

As for the justification of this argument, environmental changes trigger a society to cope up employing mitigation or adaptation through operational policies and strategies by governments. Migration, in relation, is another feature of adapting the mechanism of a population in reaction to environmental changes considering their local environment is insecure and is not able to support livelihood. Additionally, these multidimensional environmental impediments can cause socio-political and ecological insecurity, for it may lead to sort out the latest divergences in an uncompromising way.

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<sup>92</sup> Peter Haldén, *The Geopolitics of Climate Change: Challenges to the International System*, 2007, p. 28.

<sup>93</sup> Urs Luterbacher, “Environmental Constraints on Human Activities and the Environmental Consequences of Human Activities,” *International Relations and Global Climate Change*, 1996, pp. 8–9.

## CHAPTER II

### ENVIRONMENTAL MIGRATION PROBLEMS AND RISKS IN SOUTHEAST ASIAN COUNTRIES

Southeast Asia is among the front-liners exerting efforts to counter climate change and its impressions. The region is known for having archipelagos across its area, home to some of the world’s most remarkable environmental diversity. With climate change, more than a hundred of millions of inhabitants are at high risks since most of its populations are living in coastal and river delta areas<sup>94</sup>.

**Figure 2.1. The Geography of Southeast Asia**



Source: Latitudes, *Introduction to Southeast Asia: 11 Countries*, n.d., date of access: 2 October 2019, [www.latitudes.nu/introduction-to-southeast-asia-11-countries-593-million-people/](http://www.latitudes.nu/introduction-to-southeast-asia-11-countries-593-million-people/)

<sup>94</sup> ADB, “Climate Change in Southeast Asia: Focused Actions on the Frontlines of Climate Change,” 2010, p 1.

The recent extreme blow of climate change was ostensible in three Asian regions such as South Asia, the Pacific, and Southeast Asia which produced more than 30 million human displacements because of severe natural disasters in 2010<sup>95</sup>. In the years to come, with the rapid climate transformation, the worldwide human population movement will exacerbate, forming a sharp geographical movement<sup>96</sup>.

Moreover, large-scale deforestation is an enormous plus to the variation of climate in a specific area since the trees in the rain forests accumulate the heat coming from the Sun. However, rain forest itself is cleared to make space intended for cattle farms, banana, and palm oil plantations, and to make way for natural capitals utilization indispensable for economic expansion<sup>97</sup>. Deforestation, for a similar reason, paves the way to build space for rapidly growing populations, i.e., in Indonesia and the Philippines of Southeast Asia.

Southeast Asia is seen exposed to increased aridity and monsoonal variations. Warm temperatures are anticipated to escalate sea-level rise by around half a meter ranging up to 0.9 meters because of thermal expansion of seawater and the melting of glaciers<sup>98</sup>. As for water insecurity, the region is forecasted to suffer from a decrease in freshwater availability caused by a booming population and rising demands from higher standards of living. It is estimated that more than a billion people by 2050 will be affected around the globe<sup>99</sup>.

The ‘Intergovernmental Panel on Climate Change (IPCC)’ illustrated that there is an expectancy of 2°C climate setups and will directly affect economic growth and poverty reduction down to food insecurity. It then drives hunger in urban areas, and climate change will adversely intensify the multidimensional poverty incidences in developing countries and increasing societal inequality<sup>100</sup>.

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<sup>95</sup> ADB, *ibid*, p. 11.

<sup>96</sup> *Ibid*, p. 5.

<sup>97</sup> Sally Morgan, *ibid*, pp. 9–10.

<sup>98</sup> David Shearman & Joseph Wayne Smith, “Time and Tide Wait for No Man.” *The Climate Change Challenge and the Failure of Democracy*, 2007, p. 23.

<sup>99</sup> IPCC, “Climate Change 2007: Synthesis Report: Summary for Policymakers,” 2007, p. 27.

<sup>100</sup> Lennart Olsson, Maggie Opondo, Petra Tschakert, et al., *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects, Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, IPCC, Cambridge and New York: Cambridge University Press, 2014, pp. 796–797.

In recent years, the agrarian sector in Southeast Asia has been experiencing ecological pressure due to growing populations and booming industries, coupled with the adverse impacts of climate change. Escalating temperature augments the frequency of evapotranspiration, which distresses crops, particularly in those areas with limited water supply hence the enormous reduction to the yields. Intermittent rainfall patterns likewise affect farm arrangement and planting schedules and modify the life cycle of major pests and diseases affecting agricultural produces<sup>101</sup>.

Food insecurity can also be stirred by climate change, and when there is a fiasco in the food cycle and agrarian systems, it then shapes the possibility of rural migration. Migration is a natural reaction, an individual, a household, or groups of people contemplating social-environmental adaptations, especially when ecological security is no longer existent in a local environment.

Ultimately, climate change is an undeviating source for displacement and migration. The impacts of underlying environmental, social, and political challenges, with climate change, its consequences are embellishing. Hence, the exposure of a population to the risks of displacement and the motivation to people to move somewhere socio-environmentally secured because of extreme natural disasters, i.e., drought, sea-level rise, which slowly instigates human displacements<sup>102</sup>.

Having mentioned that, Southeast Asia is progressively exposed to disasters, i.e., floods and vulnerable to strong typhoons. Extreme weather conditions are anticipated to intensify the frequency of economic damage, livelihood impairment, and loss of lives<sup>103</sup>. As for a close instance, the Mekong River linked to the colossal Chinese dams are intimidating the livelihoods of 100 million people in Southeast Asia countries such as Myanmar, Thailand, Laos, Cambodia, and Vietnam<sup>104</sup>.

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<sup>101</sup> ADB, "Chapter 3 Climate Change and Its Impact: A Review of Existing Studies." *The Economics of Climate Change in Southeast Asia: A Regional Review*, 2009, p. 37.

<sup>102</sup> UN, "Migration and climate change in Asia and the Pacific," 2017, p. 5.

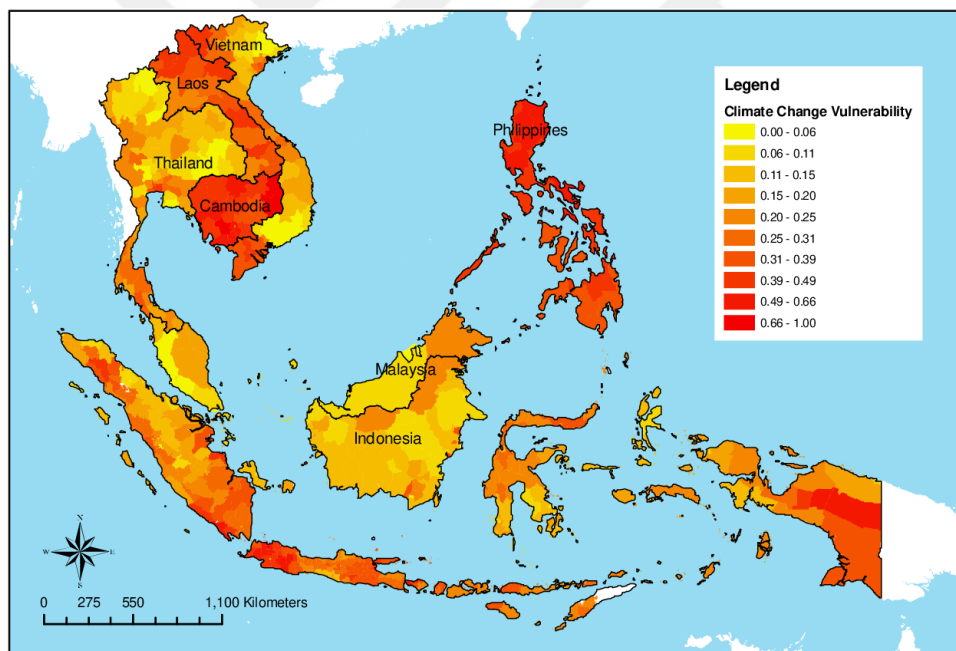
<sup>103</sup> ADB, *ibid*, p. 4.

<sup>104</sup> David Shearman & Joseph Wayne Smith, *ibid*, p. 43.

## 2.1. Dimensions of the Problem and Risks

The land loss prompted by climate change may also induct external migration across Southeast Asia where people from the Philippines may choose to move to various parts of the region, Cambodians and Vietnamese may similarly move to the east en routing to Malaysia, Myanmar, and Thailand<sup>105</sup>. Centering on this idea, it is safe to hypothesize that people from Singapore, a small island state may opt to move to their neighboring country, Malaysia. Some parts of the Indonesian archipelago may migrate within their territory, going to the big islands enough to host environmentally displaced people.

**Figure 2.2. Climate change vulnerability in Southeast Asia**



Source: Arief Anshory Yusuf & Herminia Francisco, "Climate Change Vulnerability Mapping for Southeast Asia," *Economy and Environment Program for Southeast Asia*, 2009, p. 11.

Figure 2.2. goes to show that the Philippines, Cambodia and Laos are the highly vulnerable countries in the region to the effects of climate change. However,

<sup>105</sup> NIC, *ibid*, p. 4.

all these countries are gradually becoming susceptible to the adverse outcomes of the changing climatic conditions on a larger scale, i.e., floods and rising sea level will challenge coastal communities on its mitigating mechanisms as well as their strategies, drought, irregular precipitation and increasing temperature, on the one hand, will result to agricultural discrepancies and fiasco in food security.

There are surfacing threats to coastline and island areas encompassing the swift expansion of the economy and the population. The insufficient adaptation approach in coastal areas is poorly quantified, and the obtained information is primarily qualitative. In this case, it is a motionless concern for most developing countries that have to lack in mitigation strategies, i.e., flood management systems<sup>106</sup>. Furthermore, a combination of adaptation and mitigation could be a well-thought-out realistic response to climate change for coastal regions. Therefore, strategies determined by mitigation and adaptation's consolidation foster paramount environmental arrangements to remodify the conventional methodologies in dealing with climate change<sup>107</sup>.

**Table 2.1. The climate risk index for 2013: the 10 most affected countries**

Ranking 2013	Country	Climate Risk Index Score	Fatality	Deaths per 100,000 inhabitants	Absolute losses (in million US\$ PPP)	Losses per unit GDP in %	Human Development Index
1	Philippines	2.17	6479	6.65	24538.56	3.82	117
2	Cambodia	6.67	184	1.22	1495.52	3.24	136
3	India	12.67	7437	0.60	15147.02	0.22	135
4	Mexico	15.00	224	0.19	10589.70	0.51	71
5	St. Vincent and the Grenadines	15.33	9	8.18	96.58	8.33	91
6	Pakistan	15.50	301	0.16	5419.77	0.65	146
7	Lao PDR	17.67	23	0.34	263.51	0.83	139
8	Vietnam	17.83	152	0.17	2397.04	0.50	121
9	Argentina	20.33	122	0.29	2010.00	0.22	49
10	Mozambique	21.67	119	0.46	88.21	0.33	178

Source: Sönke Kreft, et. al., "Global Climate Risk Index 2015: Who Suffers Most From Extreme Weather Events? Weather-related Loss Events in 2013 and 1994 to 2013," Ed. Birgit Kolboske and Lindy Devarti. Bonn: Germanwatch, 2015, p. 7.

<sup>106</sup> Robert Nicholls, et al., *Economics of Coastal Zone Adaptation to Climate Change. Development and Climate Change*, Discussion Paper. Washington D.C.: The International Bank for Reconstruction and Development/The World Bank, 2010, pp. 1–8

<sup>107</sup> Roberts Nicholls, "Case study on sea-level rise impacts," *Working Party on Global and Structural Policies*, 2003, pp. 14-25.

Table 2.1. openly justifies that the Philippines was the most vulnerable country by climate change. Moreover, to note, other Southeast Asian countries too made into the list, such as Cambodia which ranks second, Lao PDR and Vietnam are likewise evident to be inclined to the impacts of climate change. The climate risk index only stresses that the region is highly exposed from climate change, given data on the figure of fatalities, the ratio of casualties per definite number of populations, economic damage, GDP loss per unit, and human development index.

These are the standard indicators to redefine the magnitude of the effects of climate change. The statistics presented architects a multidimensional evaluation in substantiating the impressions of climate change to the economy, the ecosystem, and the human population. It assists governments to formulate and to vitalize preemptive countermeasures as for mitigation and adaptation are concerned.

In this context, the extent and scope of environmental migration in Southeast Asia instigated by climate change are quite distinctive, contemplating the preceding, the current and the future experiences each of the countries has and will have. The issue of environmental security in the region is also similar to the consequences caused by climate change that agitates the arising arrangements of migration in the future. Environmentally-stimulated human resettlement certainly forms an acute or a long-term migratory event internally or transboundary. In this context, the likelihood of environmental migration categorized by the familiarities of each country are as follows:

### **2.1.1. Brunei**

Brunei Darussalam is a small country situated right next to the South China Sea bordered with its neighboring country, Malaysia. The risk of Natural Disaster is low, and naturally, floods occur during the rainy period from October to May. Brunei is seldom distressed by tropical storms because the country is not positioned in the trajectory of typhoons<sup>108</sup>.

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<sup>108</sup> JICA, "Brunei: Natural Disaster Risk Assessment and Area Business Continuity Plan," Country Report, 2015, p. 1.

Brunei relies critically on the course of importation on agrarian products, i.e., rice production, because the country only has a 5.06 percent self-sufficiency rate. Hence, the government is emphasizing food security as an urgent concern to address food dependency targets specifically in rice self-sufficiency to a calculation of 60 percent by 2015<sup>109</sup>. Climate change is threatening food production systems, including water supply systems, consequently fronting a significant setback to security both in food and water production since hasty weather conditions spur an increase in the temperature, intensification of drought, and heavy rainfall.

The country is undeniably rich enough to endure the forbidding outcome of food insecurity. It is clarified that poverty, along with insecurity in food systems, the agrarian fiasco, ecological destruction, and climate change are the particular singularities that shape the decision of a rural population to migrate. Social-environmental variations, whether abrupt or gradual, make a household pick a practical option on migrating to survive the prospect of hunger and malnutrition<sup>110</sup>.

Conversely, Brunei Darussalam has suffered from flooding in the past two decades, and around 115 instances of floods and 105 experiences of landslides were documented in 2014 alone. Because of concentrated, dense rainfall sustained by backwater flow, it resulted from the tidal flux, which is beyond the volume of the drainage systems<sup>111</sup>. The extensive modification in the climate can upset the hydrological cycle arranging an imbalanced rain allocation on a global scale. It will incline to exacerbate the irregularity in precipitation, suffering drought in already dry territories, heavy rainfall in already humid regions, and concentration of quicker rainfall but more extreme<sup>112</sup>.

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<sup>109</sup> Shahriar Shams et al., "Agriculture Adaptation to Climate Change in Brunei Darussalam: A Step towards Food Security," *Environment and Urbanization Asia*, Vol. 6, Issue 1, 2015, pp. 59-70.

<sup>110</sup> UN FAO, IFAD, IOM & WFP, *ibid*, pp. 3-9.

<sup>111</sup> Shahriar Shams & Rozeana Hj Md. Juani, "Flow Assessment of Brunei River due to the Impact of Climate Change," *4th International Conference on Environmental, Energy and Biotechnology*, 2015, pp. 28-34.

<sup>112</sup> Evan Graeme Rees Davies & Slobodan Simonovic, "Climate Change and the Hydrological Cycle," *17th Canadian Hydrotechnical Conference*, 2005, pp. 47- 56.

### 2.1.2. Cambodia

There is a projected rise in the annual warmth that would be perhaps between 1.35°C and 2.5°C by 2100, and the annual precipitation is likewise guesstimated to increase from 3% to 35% with a most extensive escalation in the rainy period. Extreme floods and droughts, on the one hand, are foreseen to worsen as for its frequency, severity, and length, particularly with the countries situated along the Lower Mekong Basin<sup>113</sup>. UNESCAP's report anticipated 1.7 million or roughly 12% of the Cambodian population are highly vulnerable to floods, and the country surpassed the other ten countries in Southeast Asia for the ratio of the population at risk of being agitated by floods<sup>114</sup>.

Cambodia is hugely exposed to the results of climate change, and the Tonle Sap Basin's flooding patterns are one of the confirmations of the fluctuating weather events. In 2000, 2011, and 2013, the recorded floods and storms in the Tonle Sap Lake were the nastiest in Cambodian history that concluded to economic and humanitarian outlays<sup>115</sup>.

In a particular situation, the seaside provinces such as Kampot, Koh Kong, and Sihanoukville may experience beyond significant seawater disturbance and rainstorms. Also, the Northwest Battambang Province may similarly be bothered for a significant number of Cambodian workforce are dependent on the agriculture industry; hence, the increase of poverty scale a relative effect of changing climate<sup>116</sup>. Migration appears to be a means through which rural households retort to environmental stress. In Chanleas, migration is a superficial prospect for a single household to create a new investment at home; though it is not a suitable response to any environmental tremor.

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<sup>113</sup> Watt Botkosol, Chhuon Kong & Chea Chanthou, "The State of Climate Change in Cambodia," *The 5th AUN/SEED-Net Regional Conference on Global Environment*, 2012, pp. 1–14.

<sup>114</sup> UNESCAP, "Asia-Pacific Disaster Report," Bangkok, 2010 cited by MOE, *A Second Study on Understanding of Public Perception of Climate Change in Cambodia: Knowledge, Attitudes and Practices*, Phnom Penh, 2016, 1–3.

<sup>115</sup> CDRI, "Annual Development Review 2013- 2014: Development Inclusiveness, Sustainability and Governance in Cambodia," 2014, pp. 6–13.

<sup>116</sup> ADB, *ibid*, pp. 13-18.

However, it is tangled to a surfacing belief that the environment, both natural and economic, is unreliable<sup>117</sup>.

### 2.1.3. Indonesia

Indonesia is immensely comprised of distinct levels of biodiversity that upkeeps a multitiered array of livelihoods and lively ecosystem with astounding 80,000 km of shoreline and 17,508 islands corresponding with a high population denseness; it makes the country inclined to the vulnerable fallouts of climate change<sup>118</sup>. In the agrarian industry, one of the weakest sectors in the country, coastal inundation, and flooding trigger the land to be saturated to the point that farmers are not able to do agriculture. Its constant incidence sorts the arable land not suitable for agricultural activity; thus, a single hectare produces 30 million Rupiah or 2,000 USD yearly<sup>119</sup>.

Climate change could anguish shoreline areas and marine ecosystems. Seacoasts are delicate from sea-level augmentation, continuous ecological change and strength of wind rapidity, increased tidal height, and an upsurge in ocean warming<sup>120</sup>. Sea-level rise and saltwater intrusion have concluded to a massive blow to the livelihoods of many coastal communities destructing and reducing their physical and natural assets. In some other instances, flooding is becoming permanent hence forcing the populace to move<sup>121</sup>.

In recent studies, climate pressure stereotypically moderates the prevailing migration patterns that are formerly in place, rather than imposing a definite mass migration<sup>122</sup>. The aftermath of environmental changes may escalate the chance of internal and external migration considering the interminable proliferation of

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<sup>117</sup> Maryann Bylander, "Depending on the Sky: Environmental Distress, Migration, and Coping in Rural Cambodia," *International Migration*, 2013, pp. 2-10.

<sup>118</sup> Michael Case, Fitriani Ardiansyah & Emily Spect, "Climate Change in Indonesia Implications for Humans and Nature," 2007, pp. 3-7.

<sup>119</sup> Akhmadi, Rahmitha & Yudi Fajar Wahyu, *Impact of Climate Change on Households in the Indonesian CBMS Area*, Research Report, Jakarta: The SMERU Research Institute, 2012, pp. 15-34.

<sup>120</sup> Muhammad Zikraa, Suntoyoo, & Lukijantob, "Climate change impacts on Indonesian coastal areas," *Procedia Earth and Planetary Science* 14, 2015, pp. 57-63.

<sup>121</sup> Akhmadi, Rahmitha & Yudi Fajar Wahyu, *ibid*, p. 25.

<sup>122</sup> Maia Call & Lori Hunter, "The Gender Dynamics of Climate Migration in Indonesia: Climate Gender Migration," 2018, pp. 1-8.

frequencies of droughts and desertification, floods, land loss driven by rising sea-level, severe natural calamities, and food insecurity<sup>123</sup>.

The profound changes because of climate change can mark significant land losses of Indonesia's 80,000 km of coast regions, comprising thousands of islands and landmasses and the obliteration of the marine ecosystem. It is assessed that 60% of all Indonesians are living in coastline areas and low-lying seaside cities such as Jakarta and Surabaya<sup>124</sup>. The existing subsidence of the topography of Jakarta Bay and prevailing saltwater intrusion matching it with the sea-level rise can create a massive impact on physical, environmental, and economic security, therefore, can design environmentally-induced human resettlement or climate refugee. One of the fundamental reasons why the Indonesian Government has opted to move its capital city from the Island of Java to the Island of Borneo.

The recent earthquake and tsunami in Central Sulawesi triggered to displace 133,631 people and caused 2,101 fatalities<sup>125</sup>, an environmental consequence that exemplifies the influence of unforeseen disaster aside from climate change's impressions.

#### **2.1.4. Lao PDR**

The People's Democratic Republic of Lao, as a non-coastal state, does not warrant its security from the blow of climate change. The regional atmospheric conditions in Southeast Asia through time will eventually alter. The northern and north-western parts of the country are highly exposed to dearth. Areas alongside the Mekong River, plain parcels in the central and southern provinces are prone to flooding<sup>126</sup>, and about 13%–14% of food production comes from irrigated lands which pronounces more droughts can create an upsetting outcome on the agrarian sector<sup>127</sup>.

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<sup>123</sup> Susan Martin, "Environmental change and migration: legal and political frameworks" *Environment and Planning*, Vol. 30, Issue 6, 2012, pp. 1045–1060.

<sup>124</sup> Michael Case, Fitriani Ardiansyah & Emily Spect, *ibid*, p. 5.

<sup>125</sup> HCT, "Central Sulawesi Earthquake & Tsunami Situation Report," Situation Report, 2018, p. 1.

<sup>126</sup> MoNRE, *Promotion of Climate-related Environmental Education*, Vientiane Capital: Department of Environmental Quality Promotion, 2014, pp. 4–6.

<sup>127</sup> The Guardian, *Laos counts the cost of climate change: record floods, drought and landslides*, 5 November 2015, date of access: 4 September 2019, [www.theguardian.com/global-](http://www.theguardian.com/global-)

The total lack of livelihood may influence human migration likelihoods stimulated by the swift environmental changes—consequently forming a blend of socio-economic and environmental migration arrangements since both trigger human movement. The fundamental idea of environmental sensitivity is relatively associated with the dependency of an individual or group of people to natural capitals being disturbed by the instabilities in the environment.

It is understood that migration takes place because of the causes mentioned above but often forcing women and younger people to pursue better chances in more industrial parts of the country or in neighboring countries such as Thailand, Vietnam, China, and even farther to support their families back home<sup>128</sup>. A small-scale qualitative study of a “Gender and Development Group (GDG)” in 2011 explains that economic difficulties within households are the primary stimuli for migration and somewhat for labor migration. Although it is also prompted by environmental glitches explicitly with the failure on the harvest and the complete sell of the crops plus their social responsibility, they have to their respective families<sup>129</sup>.

Aside from environmental change-incited migration, direct dam-impelled relocation may also be dispensed up into two wide-ranging migration categories: “(i) out-displacement induced by forced resettlement in the area flooded by a reservoir; and (ii) in-migration due to direct job creation in the dam area. In the case of the ‘Lower Mekong Basin (LMB),’ it has evaluated that direct job creation resulting from the 12 planned mainstream dams should generate an estimated USD 7.9 billion in wages<sup>130</sup>”.

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[development/2015/nov/25/laos-counts-cost-climate-change-record-floods-drought-landslides-cop-21-paris-pledge](#)

<sup>128</sup> ADB, “LAO: Northern Rural Infrastructure Development Sector Project – Due Diligence for Additional Financing,” Climate Risk and Vulnerability Assessment, 2016, pp. 4–9.

<sup>129</sup> GDG, *Women in Migration Research In Vientiane Capital and Khammouane Province*, Vientiane, 2011, pp. 11–22.

<sup>130</sup> ICE, “Strategic Environmental Assessment of Hydropower on the Mekong Mainstream,” Summary of the Final Report, 2010, p. 127.

### 2.1.5. Malaysia

The Malaysian environmental situation is no different to that of the others. The feasible climate change shocks would cover rising sea-level and land loss hence the flooding in low-lying seaside communities, cut-rate of farming yields, numerous infirmities in the biodiversity, coral reef peroxidizing, tidal inundation of coastline regions, decreased water accessibility, and extreme droughts<sup>131</sup>. However, the country is conveyed to be under the sorting of ‘medium risk zone’ as per the Climate Change Vulnerability Index classification because there is somewhat similar fluctuations in temperature, precipitation density, and rising sea-level. The population may fall under the sway of migration and relocation because of stern weather settings. The well-being of the people is really intertwined with climate conditions<sup>132</sup>.

The up-to-date migration actualities imply, forced migration patterns can also take place as a result of natural adversities, intense drought or flood, nuclear disaster, earthquakes and tsunamis<sup>133</sup>. On the other hand, as for environmental degradation-induced migration in the country, that variables in an investigation do not sway immigration. One prospective intention is that environmental relations may have a catalyst course on migration than just a causal impression hence the empirical assumption do not correspond with the findings of other studies that state environmental degradation is causative element for emigration<sup>134</sup>.

### 2.1.6. Myanmar

The devastation climate change brings significantly penetrates the socio-economic and socio-political activities. Its impressions are felt in Myanmar vigorously

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<sup>131</sup> Haliza Abdul Rahman, “Climate Change Scenarios in Malaysia: Engaging the Public,” *International Journal of Malay-Nusantara Studies*, Vol. 1, Issue 2, 2018, pp. 5-15.

<sup>132</sup> Nazneen Jabin, *Economic Impacts of Climate Change and Adaptation Policy in Malaysia*, Doctorate Thesis, Kuala Lumpur: Faculty of Economic and Administration, University of Malaysia, 2015, pp.1–16.

<sup>133</sup> Andrew Simms, *Unnatural Disaster*, 2003, date of access: 30 September 2019, [www.theguardian.com/environment/2003/oct/15/guardiananalysispage.climatechange](http://www.theguardian.com/environment/2003/oct/15/guardiananalysispage.climatechange)

<sup>134</sup> see: the result of the work of Wilson Ow Chee Seong, et al., “Intertemporal Changes of the Influence of Environmental Degradation on Migration: The Case between Malaysia and Asia- Pacific Countries,” 2015, pp. 1–14.

by the marginalized people, farmers, including ethnically and religiously heterogeneous populations taking into cogitation that the country already has a trace of internal violence<sup>135</sup>. Recent climate forecasts show that “0.8–2.7°C increase of minimum temperature and a 0.8–2.6°C increase of maximum temperature by the end of 2100 under the Representative Concentration Pathway (RCP) 4.5. Under RCP 8.5, minimum and maximum temperatures will increase by 0.9–4.6°C and 0.8–4.4°C respectively. Precipitation is projected to rise by 36 percent under RCP 4.5 and 40 percent under RCP 8.5<sup>136</sup>.”

In 2008, cyclone Nargis hit Myanmar and claimed 140,000 casualties and affected more than 800,000 displacements<sup>137</sup>. Nargis has inducted long-term effect on the local economy encompassing external labor migration movement, health complications, agricultural loss, and degradation on coastal environments. More than 70 percent of the population depends directly or indirectly on forest assets, which contribute 1 percent to GDP<sup>138</sup>.

Delta, as a coastal region in the country, is defying one of the most insistent concerns that will expose the area to increasing salinity, high tidal surges, coastal erosion, and inundation. Moreover, intensifying cyclones, the risk of sea-level rise, increasing temperature, and rainfall irregularity are the likely results evolving in the next few years. The secondary magnitudes involving changed in agricultural growing seasons, and drop in sea and river fishery stocks, which in time can lead to the loss of human resettlements and will force environmental displacements<sup>139</sup>.

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<sup>135</sup> John Sagle, *Climate Change in Myanmar: Impacts and Adaptation*, Thesis, Monterey, California: Naval Postgraduate School, 2014, pp. 1–15.

<sup>136</sup> MoNREC, “Myanmar Climate Change Strategy and Action Plan (MCCSAP) 2016–2030,” 2017, pp. 11.

<sup>137</sup> The Conversation, *10 years after, Cyclone Nargis still holds lessons for Myanmar*, 2 May 2018, date of access: 8 September 2019. [www.theconversation.com/10-years-after-cyclone-nargis-still-holds-lessons-for-myanmar-95039](http://www.theconversation.com/10-years-after-cyclone-nargis-still-holds-lessons-for-myanmar-95039)

<sup>138</sup> MoNREC, *ibid*, p. 20.

<sup>139</sup> MoNREC, *ibid*, p. 20; “Climate Change and Private Sector Resilience in Myanmar,” Policy Brief. 2017b, pp. 3–13.

### 2.1.7. Philippines

In Southeast Asia, the Philippines is the most susceptible state from the inferences of climate change, tremendous natural disasters, and ecological changes due to degradation and destruction. The Philippines is drastically hit by 19 typhoons yearly making it hard for the economy to recover from the impacts. Poor Filipinos dwelling in coastal spaces are in jeopardy from the sways of strong typhoons and other natural catastrophes. Agrarians too, are suffering from the effects of climate change, intimidating their livelihood as well as the state of food security in the country.

The climatic conditions in the country are influenced by wide-ranging atmospheric occurrences hence the massive amounts of rainfall the whole year around indicating La Niña. Having mentioned that, the unparalleled distribution of rain by time and space is influencing floods plus the real environmental concern on extreme droughts because of the prevalence of El Niño.

The precipitation increase ranging from 10 or 20% would imply a rise in the runoff by 8% or 18%, and for instance, rainfall has a cut-rate of 10 or 20%, a predicted significant reduction in the runoff by 15 or 25%<sup>140</sup>. Severe El Niño in 2016 formed a considerable impact on the lives of the local farmers reeling from the 36-45 °C temperature index, making it hard to grow crops<sup>141</sup>.

In 2013, the landfall of super typhoon Haiyan in the Philippines was the most disastrous on record. It is sought to be the lethal and most powerful tropical storm that ever struck in Philippine history. A 7.5-meter-high storm surge instantly occurred that claimed thousands of casualties with approximate figures of 800,000 people who evacuated. Also, 6,183 people died throughout the central Philippines, 1,061 people went missing, and roughly 29,000 people were injured<sup>142</sup>. After the direct aftermath of

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<sup>140</sup> Aida Jose & Nathaniel Cruz, "Climate change impacts and responses in the Philippines: water resources," Vol. 12, 1999, pp. 77-84.

<sup>141</sup> Mohamadan Abdulkasan, *Dear future president: I appeal on behalf of our farmers*, 23 April 2016, date of access: 30 September 2019, [www.rappler.com/views/imho/130527-dear-future-president-youth-appeal-farmers](http://www.rappler.com/views/imho/130527-dear-future-president-youth-appeal-farmers)

<sup>142</sup> Sara Davidson, "The Philippines Shelter Cluster in response to Typhoon Haiyan/Yolanda," Evaluation Report, 2016, pp. 14–17.

the disaster, it concluded to an overwhelming figures of internally displaced people with over 4 million<sup>143</sup>.

On the other hand, climate change is projected to be an extra element in exacerbating the impairment in the state of water and soil resources, coastal regions, and biodiversity. Similarly, agro-aquatic systems may end up to land loss and destruction of agricultural production because of the sudden alteration of climate<sup>144</sup>. Contemporary studies specify that coastline areas will notably be agitated by the rising sea-level and majority of the Philippine population are living coastal cities with 60 kilometres distance from the seaside<sup>145</sup>.

A wide-ranging assessment on the up-to-date literature re environmental migration depicts that, by and large, the temperature fluctuates and devastating occurrences fuel short-distance internal migration<sup>146</sup>. It specifies the exposure of the population of the country to climatic exposure inciting extreme typhoons, rising temperature, rising sea levels, droughts, and floods; thus the Philippine archipelago composed of 7,461 islands is at risk of environmental migration.

### **2.1.8. Singapore**

Since the 1970s, Singapore has experienced a ubiquitous warming mark of 0.25°C each decade. Consequently, in the Singapore Straits, wave rise measurement records illustrate that the average sea-level has augmented by about 3mm per year in the last 15 to 17 years. However, the long-term evaluation of the past precipitation

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<sup>143</sup> Angela Sherwood, et al., “Resolving Post-Disaster Displacement: Insights from the Philippines after Typhoon Haiyan (Yolanda),” 2014, p. 7.

<sup>144</sup> Rodel Lasco, Juan Pulhin & Rex Victor Cruz, “Chapter 2: Ecosystems, their Properties and Services,” *Philippine Climate Change Assessment*, Pasig: The Oscar M. Lopez Center for Climate Change Adaptation and Disaster Risk Management Foundation, Inc. and Climate Change Commission, 2017, pp. 17–31.

<sup>145</sup> Laura David, Rosa Perez & Porfirio Aliño, “Chapter 4: Coastal Systems and Low-lying Areas,” *Philippine Climate Change Assessment*, Pasig: The Oscar M. Lopez Center for Climate Change Adaptation and Disaster Risk Management Foundation, Inc. and Climate Change Commission, 2017, pp. 55–81.

<sup>146</sup> Pratikshya Bohra-Mishra, et al., “Climate variability and migration in the Philippines,” *Population and Environment*, Vol. 38, Issue 3, 2016, pp. 286–308.

patterns does not show any extensive inclination as there has been a vast natural variability in the annual rainfall each year<sup>147</sup>.

As a small low-lying and coastal city-state, Singapore is primarily feasible to the enormities of climate change. And accordingly, the country has an emergent interest in international synergies to address prospective interferences to natural ecosystems and human societies since they are among with the many states reflected to be enormously affected by climate change<sup>148</sup>.

Sea-level augmentation and the increasing temperature are already experiential in the country. The variations of climatic settings can manifest land loss or coastal erosion, lengthy drought, and might harm the biodiversity; hence, environmental migration is a huge possibility taking into consideration that the country is composed of a small parcel of island.

### **2.1.9. Thailand**

The dominances of the sudden adjustments in climate settings in Thailand is accelerating such as the lengthy droughts, the decline of agriculture and aquaculture production, flash floods, sea-level rise, and health-related issues. These environmental dealings are surfacing to sprout severe effects and will likely erect and intensify multi-layered apprehensions in the forthcoming years. Challenges include water management concerns, worsening of class-related rigours, emerging refugee and migration crisis, loss to the tourism activity and conflict with China because of dam constructions<sup>149</sup>.

It is likely that due to the damage in the sectors of agriculture and tourism, climate change carries an immense economic, cultural, and environmental bearings<sup>150</sup>. The agriculture sector has a great prospect to be provoked by climate distresses. Global

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<sup>147</sup> NEA, *Climate Change: How It Affects You*, Singapore: Government of Singapore, 2015, pp. 2–7.

<sup>148</sup> NCCS, “Climate Change & Singapore: Challenges. Opportunities. Partnerships,” *National Climate Change Strategy Plan*, Singapore: Government of Singapore, 2012, pp. 4–15.

<sup>149</sup> Danny Marks, “Climate Change and Thailand: Impact and Response,” *Contemporary Southeast Asia*, Vol. 33, Issue 2, 2011, pp. 229–258.

<sup>150</sup> Suddida Pliankarom Thanasupsin, “Climate Change Impacts on Water Resources: Key challenges to Thailand CC adaptation,” *7th THAICID National Symposium*, 2012, pp. 1–11.

warming, too, is appraised to adversely afflict the agriculture industry in Thailand vary from \$24 billion to \$94 billion<sup>151</sup>.

In 2011, from August to December, the country was remarkably underwent flooding, which was considered one of the most upsetting calamities in the lives of the Thai people. The vast flood had begun in the North and Northeast part of the country that caused a direct effect to 65 of 77 the provinces of Thailand which resulted to more than 13 million affected population, over 800 fatalities and around 160,000 environmentally displaced<sup>152</sup>.

Nonetheless, deforestation and land destruction that led to the loss of land vegetation cover because of the diminishing environment was one of the ultimate causes of why flooding materializes. Climate change sways also activate extreme events, thus pose a high risk to the environment, to the biodiversity, and every human activity. Unrelenting environmental dealings can instigate a population to move as a response to seek refuge to other areas internally or on a distinctive paradigm, inciting migration beyond borders; this given scenario reiterates the illustration of environmental migration.

#### **2.1.10. Vietnam**

Vietnam faces stern climate-related torments and will remain to confront these effects in the future, i.e., escalating temperature, altering rainfall configurations, increasing drought and flooding experiences, water salinization and sea-level upsurge as climatic systems strengthen according to the UN<sup>153</sup>. Tropical countries like Vietnam are suffering from increased susceptibility to severe tropical storms, saline intrusion, and flooding. Such ecological effects can gradually motivate migration in the next

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<sup>151</sup> Witsanu Attavanich, "The Effect of Climate Change on Thailand's Agriculture," Archive Paper, 2013, pp. 1–15.

<sup>152</sup> Patrick Phongsathorn, "Environment and Migration: The 2011 Floods in Thailand," *The State of Environmental Migration 2011*, 2011, pp. 13-21.

<sup>153</sup> United Nations, Migration, Resettlement and Climate Change in Viet Nam, 2014, pp. 6–12.

decades<sup>154</sup>. The corresponding 75 cm sea-level rise in the region of Thanh Phu will endure 23% equivalent to 90 km<sup>2</sup> flooded<sup>155</sup>.

Moreover, three considerations that influence the decision of prospective environmental migrants: “(1) the impact of climate change on production activities; (2) the impact of climate change on the quality of life; (3) the impact of climate change on environmental quality<sup>156</sup>.” All ecological setups form a deterioration of the mitigating drought incidents and the increase of dense precipitation events. It then heightens migrants’ intent to move; thus, the average fraction of movement among people rises<sup>157</sup>.

FAO claims that due to the rising sea-level, productive lands throughout the country would basically be affected and would hurt the annual rice production. It will smudge a million tonnes of rice production, and disturb millions of people living in low-land regions. Thereafter, it will force residents to either elevate or leave their homes that can cause a consequential loss in the local and national economies<sup>158</sup>. As for human health, it is clear that climate change has an explicit effect on the health of the population because of the rising temperatures and it will lead to the progression of numerous viruses and disease-carrying illnesses prompting to a more remarkable rate of diseases, i.e., malaria and dengue<sup>159</sup>.

## 2.2. Environmental Migration Trends in Southeast Asia

A country of the migratory origin shaped by environmental changes, though based on expectancies considering the wave of climate change is unpredictable so as the supplementary environmental upheavals, internal and external migratory

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<sup>154</sup> Ian Coxhead, Nguyen Viet Cuong & Linh Hoang Vu, “Migration in Vietnam: New Evidence from Recent Surveys,” *Vietnam Development Economics Discussion Paper*, 2015, pp. 2–25.

<sup>155</sup> Phung, N. K., “Building an action plan to respond to climate change for Ben Tre, Framework of National Target Program,” Project Report, 2010, cited by Kim, Oanh Le Thi and Truong Le Minh. “Correlation between Climate Change Impacts and Migration Decisions in Vietnamese Mekong Delta,” *International Journal of Innovative Science, Engineering & Technology*, Vol. 4, Issue 8, 2016, pp. 111–118.

<sup>156</sup> Oanh Le Thi Kim & Truong Le Minh, *ibid*, p. 111.

<sup>157</sup> Vally Koubi, Sebastian Stoll, Tobias Siegfried, & Lucas Beck, “Environmental Migration Flows in Vietnam,” *Environmental Change and Migration*, 2017, pp. 2–15.

<sup>158</sup> FAO, “Climate Change Impacts on Agriculture in Vietnam,” 2011, pp. 1–6.

<sup>159</sup> Tran Duc Vien, “Climate Change and its Implication on Agriculture in Vietnam,” 2011, pp. 17–21.

movement is indeed possible. Southeast Asia as a paradigm, environmental migration itself is an extensively emergent problem in the next decades. However, in actuality, it is gradually emerging basing on various descriptions caused by intense natural disasters and climate change.

Disaster-linked migration or generally attributed as internally displaced and environmentally displaced people carry a colossal figure of cases according to ASEAN AHA Centre. In 2018, the latter guesstimates that 27,164,685 were affected by disasters; hence, the rise in the number of displacements with approximately 1,750,072 across the region<sup>160</sup>. The prevalence of natural disasters makes the region the most vulnerable part of the earth leaving aside the impacts of climate change which trigger natural disasters getting more extreme, more recurring and more erratic.

Sea-level rise is seen to change the course of migration pattern in Southeast Asia bearing in mind that most countries in the region are considered coastal and archipelagic states and Lao PDR is the lone landlocked country. However, being a non-coastal state does not manifest its non-inclusion in the countless blows of climate change which may correspondingly trigger internal human population movement. Increasing sea-level is a contributory factor to a more intense storm surges, floods, saltwater-intrusion, land loss and impairment in coastal ecosystems which affects the livelihood of the many who work in the industry of fisheries.

The Table 2.2. below demonstrates the exposure of the human population in cities to the wave height upsurge. It also goes to indicate that cities in five Southeast Asian countries are superficial to a 1-meter sea-level rise. The Philippines led the list taking 7 cities on the placing, and Manila gets the first rank having a likely 3.4 million population exposure; Jakarta of Indonesia got the 3rd rank whilst Surabaya and Ujungpandang were also documented, having a million population exposure; Thailand's Krung Thep is placed 6th with more than half a million of population exposure; Vietnam's Thanh Pho Ho Chi Minh also has nearly half a million; and meanwhile, Yangon of Myanmar has one-fourth million. Sea-level rise exposes the feasibility of environmental migration centering from the population exposure of the mentioned coastal cities in Southeast Asia.

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<sup>160</sup> CFE-DM, "ASEAN Disaster Management Reference Handbook," 2019, p. 34.

**Table 2.2. Southeast Asian Cities population exposure: wave height increase of 10% and 15%**

Rank by wave height increase		Country	City	Change in affected population		Cumulative %		Global city population rank 2000
10%	15%			10%	15%	10%	15%	
1	1	Philippines	Manila	3,438,334	3,438,334	25.7	24.8	12
3	3	Indonesia	Jakarta	836,130	836,130	42.5	41.3	11
6	6	Thailand	Krung Thep	546,157	546,157	55.4	54.8	21
8	8	Vietnam	Thanh Pho	433,176	433,176	62.2	61.9	36
9	9	Myanmar	Yangon	384,381	384,381	65.1	64.7	37
10	10	Philippines	Taguig	232,703	251,844	66.9	66.5	623
11	11	Philippines	Caloocan	212,853	212,853	68.4	68.0	251
15	16	Philippines	Davao	119,101	126,434	72.9	72.4	244
17	18	Indonesia	Ujungpandang	107,612	107,612	74.5	74.1	291
18	17	Philippines	Butuan	102,901	108,203	75.3	74.9	981
20	20	Philippines	Malabon	89,497	91,420	76.7	76.3	803
21	21	Philippines	Iloilo	87,548	91,369	77.3	77.0	756
23	25	Indonesia	Surabaya	81,921	81,921	78.6	78.1	87

Source: Henrike Brecht, et al., “Sea-Level Rise and Storm Surges: High Stakes for a Small Number of Developing Countries,” *The Journal of Environment & Development*, 2012, p. 129.

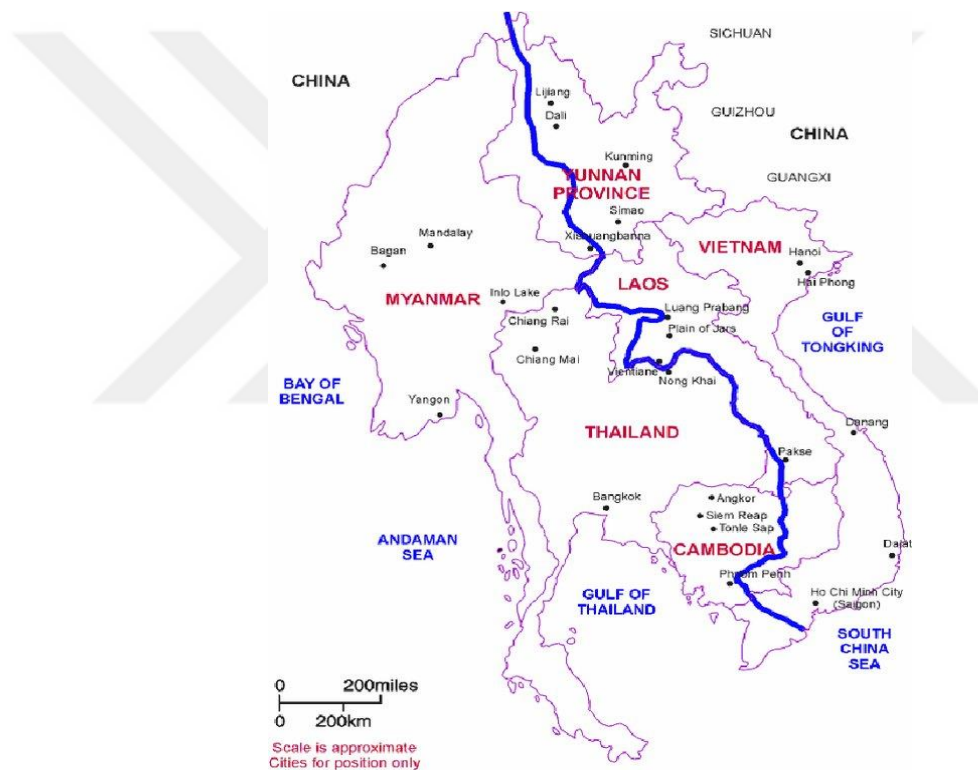
International migration is predominantly a major instance for low-lying, small-island States fronting the outlook of entire coastal lands sunk by the sea-level augmentation. Generally, extreme weather upshots, i.e., droughts, floods and severe temperatures, have a direct link to population displacement, most of which is internal and short-term, although this also contributes to international migration<sup>161</sup>. Furthermore, shreds of evidence connote that, declining agricultural yields is the conclusion of lengthy drought, increasing temperatures and disproportionate amount of rainfall prompting people to consider possibilities of migration as a means of changing livelihoods<sup>162</sup>.

<sup>161</sup> Government of United Kingdom, *ibid*, p. 41.

<sup>162</sup> ADB, *Region at Risk: The Human Dimensions of Climate Change in Asia and the Pacific*, Manila: ADB, 2017, p. 55.

The contentious announcement of Lao PDR in November of 2012 in providing a green light to the construction of the Xayaburi dam can initiate multinational and socio-environmental effects correspondingly relevant to migration, which is entirely in contradiction of the will of the three downstream riparian States<sup>163</sup>. Also, on the recent pronouncement of Lao PDR, the construction of the Luang Prabang dam project will be materialized despite warnings<sup>164</sup>.

**Figure 2.3. Chance of Environmental Migration in Riparian Countries:  
The Case of Mekong River**



Source: Ashim Das Gupta, “Challenges and Opportunities for Integrated Water Resources Management in Mekong River Basin,” *Role of Water Sciences in Transboundary River Basin Management*, 2005, p. 223.

<sup>163</sup> Marie Le Texier, “Dam-induced migration in the Mekong Region,” *The State of Environmental Migration 2013*, 2013, p. 129.

<sup>164</sup> Andrew Nachemson, *Laos to go ahead with Luang Prabang dam project despite warnings*, date of access: 24 September 2019. [www.aljazeera.com/news/2019/09/laos-luang-prabang-dam-project-warnings-190924102523452.html](http://www.aljazeera.com/news/2019/09/laos-luang-prabang-dam-project-warnings-190924102523452.html)

An estimated 29.6 million population who live and work within 15 kilometers of the Mekong River along the 'Lower Mekong Basin (LMB)' will be affected. Moreover, 2.1 million of these are local communities within 5 kilometers interfacing between land and the river are anticipated to be at most risk of the direct effects of the LMB mainstream dams. Approximately, 106,942 people may experience direct effects from these plans that will end up terminating people's resettlements and farmlands, which may instigate migration. On the one hand, 47 districts home for 2 million populace living within the planned reservoirs projects downstream of the 11 LMB dam-site projects are at premier threat of secondary consequences<sup>165</sup>.

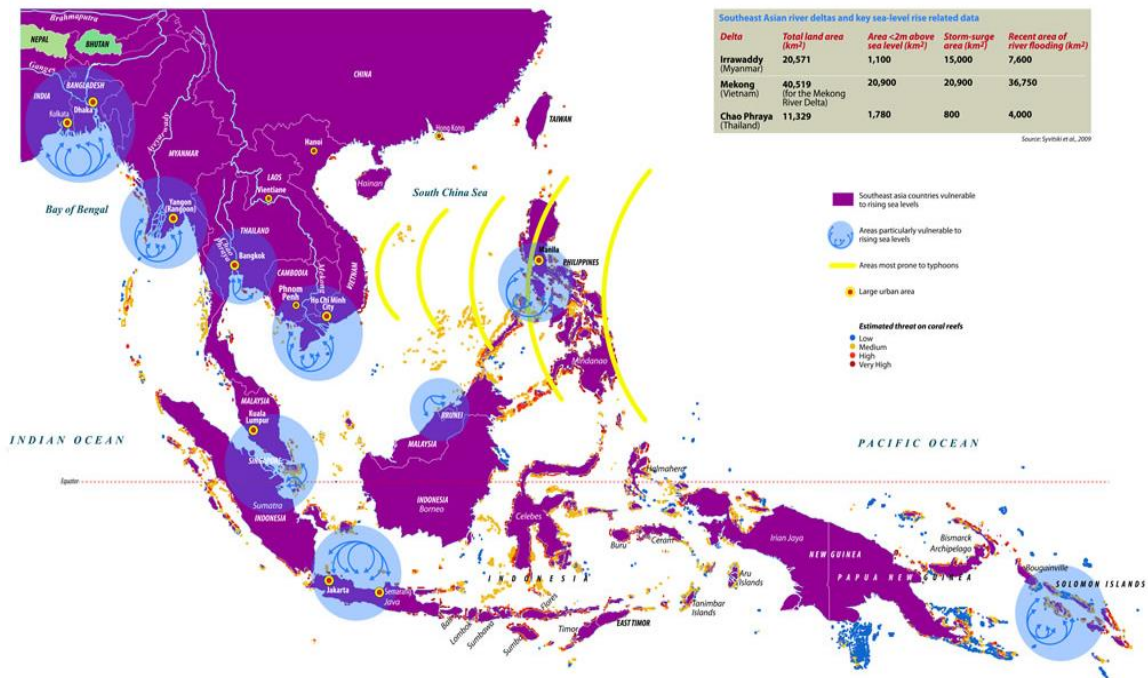
Upstream significances carry what will hereafter be called direct results such as migration patterns in the Riparian region, therefore, forcing the population movement escaping of the submerged areas. These migration arrangements can be planned, or may last for a short term but will depend on the magnitudes of the flooding. Nonetheless, this environmental and human-made crisis may also instigate permanent resettlements for residents. Similarly, alterations in the ecosystems along the Mekong river will directly affect aquaculture and agricultural activities, both are indispensable to the livelihoods of hundreds of thousands of people living along

Migration trend in Southeast Asia may escalate internally reflecting on the vast number of population exposure in most cities in the region. Well, it is not shocking that the Philippines has dominated the list having five of its populous cities highly exposed to climate vulnerabilities although Indonesia too has at least three of its big cities. Nonetheless, five out of ten countries in the region have also made into the list having one or two of their cities recorded. This climate-exposure trend animates the reality that Southeast Asia is vulnerable to the impacts of climate change hence the massive possibility of migration internally.

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<sup>165</sup> ICEM, *ibid*, p. 16.

**Figure 2.4. Southeast Asian Countries: vulnerability to rising sea levels**



Source: The World Bank, 2013, Turn Down the Heat: Climate Extremes, Regional Impacts and the Case for Resilience; World Research Institute, 2011, Reefs at Risk; Joint Typhoon Warning Center, 2011; designed by Laura Canali, date of access: 24 September 2019, [www.connect4climate.org/infographics/visualising-warming-world](http://www.connect4climate.org/infographics/visualising-warming-world)

Furthermore, Figure 2.4. guesstimates that based on the illustration highlighting the blue coloured loops, sea-level rise may instigate internal migration pattern in every country in the region, specifically those low-lying coastal regions and small islands. Large urban areas, as referred to by the graphics, may vastly be impacted by the influences of climate change such as increasing tidal inundation, flooding incited by sea-level rise and extreme tropical storms, which, may form environmentally-triggered migratory arrangements within every Southeast Asian state.

These are the scopes falling in the fourth quartile standards (*mildly vulnerable, moderately vulnerable, or highly vulnerable*): “all the regions of the Philippines, the Mekong River Delta region of Vietnam; almost all the regions of Cambodia; North and East Lao PDR; the Bangkok region of Thailand; and the west and south of Sumatra, and western and eastern Java in Indonesia.” Moreover, the Philippines,

contrasting other Southeast Asian countries, is not only susceptible to tropical storms (the yellow wave-like in the graph show the areas prone to typhoon) but also to other climate-related hazards, e.g., landslides, floods, droughts, and sea-level rise<sup>166</sup>.

The increase in sea level in Southeast Asia indicates a complex risk of coastal flooding, augmented erosion of coastal land, destruction in ecosystems, and larger salinization of agrarian land-dwellings at low altitude above sea level affecting food security. Additionally, the region is prone to typhoons too, hence the increase in the intricacies of coastline flooding, shaping an increased exposure to coastal hazards for communities adjacent to the seaboard. The experience of the Philippines of typhoon Haiyan reveals the extent of devastation it caused to the economy and the environment; it similarly exposes the extraordinary number of casualties and the magnitudes of population displacement.

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<sup>166</sup> Arief Anshory Yusuf & Herminia Francisco, *ibid*, p. 10.



In the 4<sup>th</sup> century CE, increasing drought and frigid temperatures from a lengthy cold break triggered the Huns and German groups to surge throughout the Volga and Rhine into warmer Gaul and eventually led to the sack of Rome by the Visigoths. Similarly, in the 8<sup>th</sup> century Muslim growth into the Mediterranean and southern Europe was compelled by aridity in the Middle East<sup>169</sup>. Today, environmental problems and its swift alterations have caused several movement also prompted by climate change.

In connection, climate change is anticipated to mark an incremental increase in global temperatures by 3°C to 5°C in this century aside from the reduction in precipitation, increasing sea level temperature and rainfall irregularity in many regions. The rise in sea-level is claimed to be a threat to the Middle East, considering most of its populations are living in low-lying coastline areas<sup>170</sup>. There is an immediate concern that migration crisis in the region may escalate regardless if it refers to environmental migration, forced migration instigated by environmental change, environmentally displaced persons, climate refugees and any other terminologies as migration induced by a wide range of environmental causes is gradually becoming a reality<sup>171</sup>.

Accurately saying, climate change is not the sole rationale behind human mobility and resettlements. Migrants of today tend to move to places because of economic prospects like the cases of some foreign workers in the Middle East who preferred to immigrate because of economic intentions. However, climate change has an direct and indirect bearings to the economy, i.e., extreme weather situations affecting workers productivity; severe floods and droughts upsetting agricultural yields; and sea-level rise that may induce resettlement to low-lying areas. Economic undertakings greatly depend on the productivity of the workforce including the quantity of production, and with climate change, this could be drastically disturbed.

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<sup>169</sup> Alan Dupont & Graeme Pearman, "Heating up the planet: Climate change and security," Issue 12, 2006, p. 1.

<sup>170</sup> Franck Adoho & Quentin Wodon, "Chapter 4: Perceptions of Climate Change, Weather Shocks, and There is a 156 Impacts on Households," *Climate Change and Migration: Evidence from the Middle East and North Africa*, Ed. Quentin Wodon, et al., Washington D.C.: World Bank, 2014, p. 89.

<sup>171</sup> Franck Adoho & Quentin Wodon, "Chapter 7: Do Changes in Weather Patterns and the Environment Lead to Migration?," *Climate Change and Migration: Evidence from the Middle East and North Africa*, Ed. Quentin Wodon, et al., Washington D.C.: World Bank, 2014, p. 145.

Moreover, migratory conclusions are subjective by a wide array of concerns linked to climate change, incorporating the threats of climate events causing floods and droughts which may result to destruction and a secondary effects, i.e., less productive agrarian activities, water scarcity and health problems impacted by extreme temperatures<sup>172</sup>. The future shapes of human mobility and resettlements will significantly vary from the severity of climate change comprising its consequences, but, governmental interventions otherwise may prevent it provided that efficient mitigation plans are carried out as, immediate response, on the one hand, is needed.

The reflection of how climate change may influence population movement is an urgent issue in environmental politics to track. It provides governments relevant information on how their states and constituents will cope with the effects of climate change by applying mitigation strategies and adaptation mechanisms.

In the Middle East, contrasting with the paradigm of Southeast Asia, the dimensions of the risk and problems on environmental migration present in the region are similar to every country which makes this chapter more of a regional assessment on the possibility of migration incited by environmental changes specifically climate change.

### **3.1. Dimensions of the Problem and Risks**

The dispossession and forced migration in the Middle East continue to be the significant elements of contemporary life in the region<sup>173</sup>. The actuality of climate change is stretching the capacity of societies to handle, a pace distinct from anything before. Along with the blowout of countless wars and conflicts, climate change itself has surfaced instantly, being one of the most significant drivers of change in the region. Thus, it accelerates the increase of social vulnerability and worsening inclinations of

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<sup>172</sup> Nicholas Burger, Audra Grant, Sarah Kups, Yashodhara Rana & Quentin Wodon, "Chapter 2: Focus Countries," *Climate Change and Migration: Evidence from the Middle East and North Africa*, Ed. Quentin Wodon, et al., Washington D.C.: World Bank, 2014, p. 39.

<sup>173</sup> Dawn Chatty, *Displacement and Dispossession in the Modern Middle East*, Ed. Eugene Rogan. New York: Cambridge University Press, 2010, p. 1.

resource insecurity and population displacement due to surfacing natural disasters triggered by the climate change<sup>174</sup>.

Looking back to history, earthquake is an apparent natural phenomenon in the region. For the last 50 years, there were six massive earthquakes on record that occurred. Such as, in Cairo in 1992 with 5.8 magnitudes, claiming 445 fatalities and leaving 6,512 injured; Northern part of Yemen in 1982 with 6.0 magnitude, roughly 2,800 recorded casualties and 1,500 cases of injuries; Van, Turkey in 2011 with 7.1 magnitudes, leaving 604 dead and 4,152 seriously wounded; the 1999 Marmara earthquake with 7.1 magnitudes in Turkey that claimed 17,000 lives with 43,959 recorded injuries<sup>175</sup>; and recently the Elazığ earthquake with 6.8 magnitudes that claimed 41 fatalities<sup>176</sup>; and the 6.6 magnitude Bam earthquake happened in 2003 in Iran with 26,371 recorded fatalities and more than 30,000 injuries<sup>177</sup>.

Flooding, as well, is turning out to be an ostensible natural disaster displaying some remarkable flooding events in the last decades. The 2009 flooding in Jeddah of Saudi Arabia claimed at least 124 lives and details disclosed that it could probably reach 500. In 1996, Yemen was hit by massive flooding with recounted 338 casualties, and it resulted in displacements of more than 22,000 families. Jordan, similarly, suffered from deadly flooding with 259 verified fatalities. The blizzard in Iran in the year 1972 is considered one of the lethal in history with notable low temperatures had concluded to at least 4,000-6000 reported number of dead<sup>178</sup>.

Specific events, such as hasty variations in economic, political, social, or environmental settings, may result in reactive patent migration. The eruption of war or uprising, ethnic cleansing, radical extremist activity, or other intense conflicts will end in a swift and wide-range movement of people. When a population feels that they are

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<sup>174</sup> UNDP, *Climate Change Adaptation in the Arab States: Best Practices and lessons learned*, Bangkok: 2018, p. 6.

<sup>175</sup> Jason Lemon, *12 of the worst natural disasters in MENA since 1965*, StepFeed, 13 November 2015, date of access: 15 January 2019. [www.stepfeed.com/12-of-the-worst-natural-disasters-in-mena-since-1965-4944](http://www.stepfeed.com/12-of-the-worst-natural-disasters-in-mena-since-1965-4944)

<sup>176</sup> CNN Türkiye, *Elazığ'da 6.8 Büyüklüğünde Deprem*, 24 January 2020, date of access: 07 February 2020, [www.cnnturk.com/video/turkiye/elazigda-6-8-buyuklugunde-deprem](http://www.cnnturk.com/video/turkiye/elazigda-6-8-buyuklugunde-deprem)

<sup>177</sup> Jason Lemon, *ibid.*

<sup>178</sup> *Ibid.*

at severe danger or that their food supply, housing, or livelihood are exposed from threats, they will reactively migrate<sup>179</sup>.

The Middle East, just like Southeast Asia, is particularly susceptible to climate change. It is known as one of the world's most water-scarce regions, it then has a significant dependency on climate-sensitive agrarian activities, and an outsized share of its population and economic undertakings are located in flood-prone urban coastal zones<sup>180</sup>. The agricultural sector, which relies on a 70 percent rain-fed, is at high risk of changing climatic conditions. Agriculture is the largest industry that generates jobs in most Arab countries hence the enormous contribution to national economies. The annual water discharge is estimated to drop by 15–45% in a 2°C global temperature, and abnormal heat will distress one-third of the landmass impacting local food production<sup>181</sup>.

According to the recent IPCC assessment, the Middle East alongside North Africa is forecasted to become even warmer and drier in the years to come. Complex temperatures and cut-rate precipitation will intensify the rate of droughts, a conclusion that is already happening. It is guesstimated that over 80–100 million people are exposed to water stress by 2025<sup>182</sup>.

Additionally, the 5 percent of global population living in the Middle East are on 1 percent of the world's water. The problem with water scarcity is not solely an issue surfacing to liberal democracies, as nondemocratic states, i.e., China and almost all Middle Eastern States front the same water security problems. Water depletion is a direct consequence of an augmented demand for water produced through the dictations of the economic requirement for enlarged economic progression<sup>183</sup>.

It is therefore clear that the Middle Eastern societies are under pressure to adjust from water depletion and scarcity, including the threats posed by the rising

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<sup>179</sup> Anthony Richmond, *Global apartheid: Refugees, racism, and the new world order*, Oxford University Press, 1994, p. 65. as cited by Dawn Chatty, *Displacement and Dispossession in the Modern Middle East*, Ed. Eugene Rogan, New York: Cambridge University Press, 2010, p. 17.

<sup>180</sup> The World Bank, *Climate Change: Middle East Faces Looming Challenges*, Ed. Hedi Larbi, Issue 2, The World Bank Middle East Department, 2010, p. 6.

<sup>181</sup> Katharina Waha, et al., "Climate change impacts in the Middle East and Northern Africa (MENA) region and their implications for vulnerable population groups," *Regional Environmental Change*, 2017, p. 2.

<sup>182</sup> The World Bank, *ibid*, pp. 6–7.

<sup>183</sup> David Shearman & Joseph Wayne Smith, *ibid*, p. 48.

temperatures so as the irregularity in precipitation discharges. Water insecurity as a secondary result induced by climate change is somewhat a threat also to food security. Agricultural products have a high dependency on water, and without it, the agriculture industry may barely survive. The same scenario goes to the population where their livelihood depends on.

Increasing sea-level may pose extraordinary intimidations to most Arab metropolises during the second half of the 21st century, accompanying it with remarkable consequences socially and economically<sup>184</sup>. The Mediterranean coastal region, moreover, is home for a considerable number of economic and industrial activities, including some essential tourist destinations. The precipitation along the coastal zone in winter varies between 130 and 170 mm/year and declines progressively to the south, and the tidal range is approximately 30–40 cm<sup>185</sup>.

Sea level rise is likely to candidly disturb the safety and quality of living of millions of populations of the Arab region's coastline cities in the future. The effects of sea-level rise on coastal areas may cover many facets comprising sways on water assets, agricultural, and health capitals in the coastline belts. Frequently, environmental bearings are intensified by some complementary phenomena such as the descending of low-lying landmass, saltwater salinization, and water intrusion. Moreover, each of the Middle Eastern countries has distinctive characteristics that may be impacted by the changing climate and altering environment that later may induce migration.

### 3.1.1. Bahrain

The Kingdom of Bahrain is an archipelago having roughly 36 islands, shoals, and small islets that differ substantially in size and structure and is situated in one of the most arid regions of the world. The air temperature varies between 14°C and 41°C,

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<sup>184</sup> Laurent Lambert & Cristina D'Alessandro, *Climate Change, Sea Level Rise, and Sustainable Urban Adaptation in Arab Coastal Cities*, 12 February 2019, date of access: 13 October 2019. [www.mei.edu/publications/climate-change-sea-level-rise-and-sustainable-urban-adaptation-arab-coastal-cities#\\_ftn19](http://www.mei.edu/publications/climate-change-sea-level-rise-and-sustainable-urban-adaptation-arab-coastal-cities#_ftn19)

<sup>185</sup> Mohamed El Raey, "Impact of Sea Level Rise on the Arab Region," 2010, p. 21.

and the average annual air temperatures have been steadily increasing over the period 1950-2010, while rainfall patterns are less happening<sup>186</sup>.

With the risks of climate change, the population may be at threat of freshwater availability reflecting the country as one of the lowest per capita of freshwater availability globally. Further, Bahrain too, is dubbed a one of the world's most water-stressed states taking into consideration the rapid population growth per capita of freshwater share since it steadily deteriorating from 525 m<sup>3</sup> a year in 1970 to less than m<sup>3</sup> a year in 2010, a much fewer than the total water poverty line of 500 m<sup>3</sup> per capita annually<sup>187</sup>. Water source in Bahrain comes from groundwater, desalination, and treated sewage effluent<sup>188</sup>.

This water crisis led Bahrain to seek help by applying for \$9.8 million from the U.N. to combat the effects of climate change and assist in managing its water resource. The government itself says that the country is severely threatened by the alterations of climatic conditions<sup>189</sup>.

With climate change, it is usual that in the future, there is an increase in climatic irregularity that may prime to adverse impressions on several exposed sectors, systems, and livelihoods in Bahrain. The country is likewise seen vulnerable to the escalating sea-level rise since it is composed of 36 islands, small islets and shoals due to global climate change. Hence, environmental displacement leading to a formal migration pattern may also arise considering sea-level rise will disturb communities in the small islands and islets in the country.

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<sup>186</sup> Kingdom of Bahrain, "Bahrain's Second National Communication," 2012, p. 3.

<sup>187</sup> Waleed Al-Zubari, Alaa El-Sadek, Mohamed Al-Aradi, & Hameed Al-Mahal, "Impacts of climate change on the municipal water management system in the Kingdom of Bahrain: Vulnerability assessment and adaptation options," *Climate Risk Management*, 2018, p. 95.

<sup>188</sup> Kingdom of Bahrain, *ibid*, p. 9.

<sup>189</sup> Arabian Business, *Bahrain 'severely threatened' by climate change*, 18 October 2018, date of access: 11 October 2019. [www.arabianbusiness.com/culture-society/406451-bahrain-severely-threatened-by-climate-change-says-government](http://www.arabianbusiness.com/culture-society/406451-bahrain-severely-threatened-by-climate-change-says-government)

### 3.1.2. Egypt

Egypt has a large population making the country exposed to climate change. The densely populous Nile delta is, too, extremely vulnerable from the escalating sea-level rise. Recent findings specified that the following extents are the most susceptible in terms of gravity and certainty of fallouts: agriculture, coastal zones, aqua-culture and fisheries, water resources, human habitat and settlements, and public health. The delta encompassing the narrow valley of the Nile cover 5.5% of the area of Egypt but have around 95%, its populace, and agriculture. The country's Mediterranean coastline and the Nile estuary are acknowledged as exposed to sea-level rise<sup>190</sup>. A study result disclosed that roughly 7% of the Nile Delta region is at risk of inundation that will be induced by rising sea-level<sup>191</sup>.

The ‘Ministry of State for Environmental Affairs (MSEA)’, likewise, affirmed that Egypt is affected by direct and indirect waves of climate change, i.e., heat waves that has a direct impact on health conditions, food security, energy consumption, tourism and infrastructure while Nile flow variabilities similarly, has a bearing to health conditions and food security. Sea-level rise increase, on the one hand, would trigger population migration and agitate food security<sup>192</sup>.

Linking to the issue of spatial movement, significant portions of farmlands in the Nile Delta may become unproductive because of the submergence or salt-water intrusion caused by sea-level rise. The cutback in agriculture landmass will increase unemployment rates and will result in immigration to bigger metropolises. A significant ratio of the population live coastline cities such as Alexandria, and likely,

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<sup>190</sup> UNDP, *Egypt: Climate Change Adaptation*. n.d., date of access: 12 October 2019. [www.adaptation-undp.org/explore/northern-africa/egypt#targetText=Egypt's%20large%20population%20makes%20the,to%20analyze%20possible%20adaptation%20measures](http://www.adaptation-undp.org/explore/northern-africa/egypt#targetText=Egypt's%20large%20population%20makes%20the,to%20analyze%20possible%20adaptation%20measures).

<sup>191</sup> *see*: the results regarding the risk of inundation in Nile Delta due to SLR, Mervat M. Refaat & Yasser Eldeberky, “Assessment of Coastal Inundation due to Sea- level Rise along the Mediterranean Coast of Egypt,” *Marine Geodesy*, 2016, p. 1.

<sup>192</sup> Hoda Omar Elshawadfy, *Case Study: Egypt’s Vulnerability and Adaptation Needs Assessment*, n.d., Ministry of State for Environmental Affairs, date of access: 12 October 2019. [www.unfccc.int/sites/default/files/resource/3\\_Egypt\\_Climate%20Change%20Vulnerability%20%26%20Adaptation%20in%20Egypt9-7me.pdf](http://www.unfccc.int/sites/default/files/resource/3_Egypt_Climate%20Change%20Vulnerability%20%26%20Adaptation%20in%20Egypt9-7me.pdf)

social conflicts may arise, related to the absence of essential commodities, i.e., water and sanitation conditions in slums within such cities<sup>193</sup>.

### 3.1.3. Iran

Iran's area coverage of several types of climate is 35.5% hyper-arid, 29.2% arid, 20.1% semi-arid, 5% Mediterranean, and 10% wet type. It manifests that the country's territory has more than 82% located in the arid and semi-arid parts of the globe. As for the average precipitation discharge, it is roughly 250 mm less than 1/3 or 860 mm of the rainfall on a global scale. Climatic events and extreme temperature changes are occasionally ranging from -20 to +50°C, and severe drought is also predictable in Iran's climate<sup>194</sup>.

The reality of climate change in Iran is higher and more severe than the experience of other countries in the Middles East. Researches indicate a dryer regime in the future and lesser precipitation events, which is more evident in the warm season, signifying the inconsistent variations with global warming and climate change<sup>195</sup>. Such climate results may prime to the negative impact on the socio-economic activity of the country, especially in the agriculture industry. Escalating the risk of drought incidents will threaten water and food security.

While environmental apprehensions may develop as one of the critical influences underlying internal migration decisions, population movement within the country per se is not a contemporary experience. A significant occasion of internal migration arisen over a century ago when major oil fields were discovered that led to the growth of the economy, which transformed main cities into centers of economic activity, and significant flows of rural-to-urban migration begun. But now, contemplating the average annual temperature and rainfall levels as alternatives for

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<sup>193</sup> UN, *Millennium development goal indicators*, n.d., [unstats.un.org/unsd/mdg/Data.aspx](http://unstats.un.org/unsd/mdg/Data.aspx) cited by Khaled Abubakr Ali Abutaleb, Asmaa Hassan El-Sayed Mohammed and Mahmoud Mohamed Ahmed, "Climate Change Impacts, Vulnerabilities and Adaption Measures for Egypt's Nile Delta," *Earth Systems and Environment*, 2018, p. 186.

<sup>194</sup> Mohamad Javad Amiri & Saeid Eslamian, "Investigation of Climate Change in Iran," *Journal of Environmental Science and Technology*, Issue 3, 2010, pp. 208-216.

<sup>195</sup> Mohammad Reza Mansouri Daneshvar, Majid Ebrahimi & Hamid Nejadsoleymani, "An overview of climate change in Iran: facts and statistics," *Environmental Systems Research*, Vol. 8, Issue 7, 2019, p. 2.

climate factors and linking the push factors to the robust inter-province spatial correlation, fallouts show that a rise in temperature and a drop in precipitation act as an essential aspect in environmental migration<sup>196</sup>.

The immense environmental changes is apparent in the country. Intensifying environmental conclusions induced by climate change may back the dynamic flow of migratory movement of populations living in most disturbed areas by desertification, rising sea levels, destruction of natural capitals, food insecurity, and availability of potable water.

#### **3.1.4. Iraq**

A post-conflict Iraq remains to surface complex challenges such as domestic and regional, environmental, security, political and economic issues. Whereas terrorism and governmental corruption continuous to get international attention, while climate-related security threats have only just commenced to incline in the political outline<sup>197</sup>. The country is defied by various security risks linked to climate settings which may distress the persistent sustenance of peace and stability. The dynamics of climate change usually frames climate-linked security pressures, socio-economic and environmental security concerns and for Iraq, conflict and security are add-ons.

Moreover, the Shatt al-Arab bay in the Arabian Gulf, the coastline of Iraq is deemed narrow, but, because it's low elevated it is then threatened by the increasing sea-level rise. The low-lying areas seem to encompass through Basra City and to the North of the city even for a 1-meter sea-level rise. The prospective bearing may affect soil salinity by salt water intrusion, and ultimately, may cause severe inundation of several areas of the Tigris and Euphrates delta and may drive the population displacement and trigger damage of the infrastructures<sup>198</sup>.

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<sup>196</sup> Mehdi Shiva and Hassan Molana, "Climate Change Induced Inter-Province Migration in Iran," Discussion Papers in Economics and Finance, 2018, p. 17.

<sup>197</sup> Expert Working Group on Climate-related Security Risks, "Iraq Climate-related security risk assessment," Assessment Report, 2018, p. 4.

<sup>198</sup> Nasrat Adamo & Nadhir Al-Ansari, *Climate Change Impacts: The Middle East and Iraq in Focus*, 2018, p. 26.

One of Iraq's main environmental happenstances is adjusting to the increasing variability of the country's climate, more certainly on the availability of water supply. The severe drought experienced between 2007 and 2009 followed by several months of impulsive dense precipitation and storms during which some portions of central and southern Iraq experienced rainfall amounts of roughly 200% of the average<sup>199</sup>. Additionally, 31% of Iraq's landmass is desert. Years of inapt farming practices and mismanagement of water resources have impaired the results of a previously dry climate and added to mounting rates of desertification<sup>200</sup>.

The effects of the fluctuating weather arrangements are felt in recent years with complex rate and strength of extreme climate events accompanying it with increasing environmental destruction. Further, it put the natural assets in a strain stance and led to resource scarcity. The forthcoming magnitudes of the upshots of climate change are drawn in relation to food and water insecurity, deterioration of agricultural lands and population resettlement which may create a supplementary complications to security and country's stability.

### **3.1.5. Israel**

Israel is a country situated in a region where hot and reasonably cold weather transpires, lying in an arid southern section of West Asia and wet northern Mediterranean part. The climate in the Mediterranean portion is typical with mild, rainy winters, relatively hot and dry summers having short transitional seasons. During summers, the country suffers from the dry season, thus entailing irrigation systems to water the crops.

In contrast to the years 1961-1990, the IPCC forecasts an increase of 1.5°C in Israel's standard temperature by 2020; hence, the average temperature in the years 2071-2100 is expected to increase further by 5° C and 3.5° C, respectively. Additionally, a 10% decline in precipitation is likely to occur by 2020, reaching a 20%

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<sup>199</sup> USDA, Foreign Agricultural Service, Commodity Intelligence Report, 2010 cited by Inter-Agency Information and Analysis Unit, *Climate change in Iraq*, 2012, p. 6.

<sup>200</sup> Ibid, p. 5.

decrease by 2050. Agriculture accounts for nearly 60% of the water used, but approximately half of this water constitutes effluents and marginal water<sup>201</sup>.

The scarcity of water resources due to severe drought is the most constraint in the agrarian industry. However, to cope with this climate challenge, the country has innovative systems and formulated mitigation and adaptation strategies in food production. It involves highly automated technologies and water-saving irrigation techniques, which have facilitated it to develop as a frontrunner in the field of modern agriculture. Although reality speaks that this does not change the fact that there is a scarce of water in the country that will gravely affect its populations.

Moreover, regional-scale findings imply that the Mediterranean is predominantly vulnerable to augmented flooding by storm surges as sea levels rise at a 1-m rise in sea level would instigate a six-fold escalation in the number of people experiencing such flooding in a typical year<sup>202</sup>. UNDP reiterates that sea-level rise is at Sea level rise of 12-88cm<sup>203</sup>. A rise in the Mediterranean sea-level would mean loss of shoreline areas and quicken cliff erosion. The extent of these effects will be a function of the extent of the sea-level rise<sup>204</sup>. Based on this stance, sea-level rise expansion is parallel to coastal damage to the biodiversity and human settlement hence the displacement.

### 3.1.6. Jordan

Jordan covers an area of over 90,000 km<sup>2</sup> in the hot and arid region of West Asia. It is an almost landlocked country, bordered by Israel and the West Bank to the west, Syria to the north, Iraq to the east and Saudi Arabia to the southeast. In the eastern part of the country is mostly desert; altitudes therein range from 300 to 1,500 metres, and the annual rainfall discharges is less than 50 mm while the central region has a

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<sup>201</sup> State of Israel, *Israel's Second National Communication on Climate Change*, Ed. Moshe Yanai Axelrod and Shoshana Gabbay, Ministry of Environmental Protection, 2010, p. 25.

<sup>202</sup> Robert Nicholls & Frank M.J. Hoozemans, "The Mediterranean: vulnerability to coastal implications of climate change," *Ocean & Coastal Management*, Vol 31, Issue 2, 1996, p. 105.

<sup>203</sup> UNDP, *Israel: Climate Change Adaptation*, n.d., date of access: 10 October 2019, [www.adaptation-undp.org/explore/western-asia/israel](http://www.adaptation-undp.org/explore/western-asia/israel)

<sup>204</sup> Micha Klein, Michal Litcher & Dov Zviely, "Recent sea-level changes along Israeli and Mediterranean coasts," *Contemporary Israeli Geography*, Vol. 60-61, 2004, pp. 167–176.

topography of the Jordanian highlands with an average altitude of 900 metres having an annual 600 mm amount of precipitation in the north<sup>205</sup>.

Agriculture is a contributor to the country's GDP but has declined relatively from 20% in 1974 to less than 2.9% in 2011<sup>206</sup>. A crucial issue in the agriculture industry is that while it only delivers 19% of Jordan's food requirements and employs only 1.8% of Jordan's workforce, it withdraws 65% of Jordan's freshwater resources. The water sector reiterates a crucial challenge to the country since it has one of the lowest levels of water availability per capita in the world with less than 145 m<sup>3</sup>. The Vision 2025 document highlights the disproportion between water demand and the availability of water resources because of low natural supply, constant drought, overconsumption, over pumping and losses during distribution<sup>207</sup>.

Climate change will further act as a risk of flooding often followed by massive rainfall events in winter seasons upsetting agrarian lands and infrastructures, leaving human casualties. The secondary impact of droughts embraces augmented migration to the urban areas. Ultimately, the anticipation of the merged results of climate change and population growth would be supplementary to spatial movement constructing more pressure on limited land and water resources hence the increase to the practice of sustainable development in Jordan<sup>208</sup>.

### 3.1.7. Kuwait

Kuwait is positioned at the north-western end of the Arabian Peninsula, occupying a landmass of 17,818 square kilometres. The country has approximately 500km of coastline along its mainland and islands, has a hot and dry climate with regular annual precipitations of about 116 millimetres and average steady high temperatures in the summer above 40°C<sup>209</sup>.

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<sup>205</sup> UNDP, *Jordan: Climate Change Adaptation*, n.d., date of access: 13 October 2019, [www.adaptation-undp.org/explore/western-asia/jordan](http://www.adaptation-undp.org/explore/western-asia/jordan)

<sup>206</sup> MOE, "Jordan's Third National Communication on Climate Change," United Nations Framework Convention on Climate Change, 2014, p. 15.

<sup>207</sup> Ministry of Environment, *A National Green Growth Plan for Jordan*, Amman: Hashemite Kingdom of Jordan, 2017, p. 15.

<sup>208</sup> Ministry of Foreign Affairs, "Climate Change Profile: Jordan," Country Profile, 2018, pp. 3–4.

<sup>209</sup> Environment Public Authority, "Kuwait's Initial National Communications under the United Nations Framework Convention on Climate Change," 2012, pp. 1–6.

Kuwait, geographically speaking, is highly exposed to the impressions of climate change, i.e., surging mean annual temperatures, variations in rainfall discharge patterns, sea-level rise, and changes in extreme weather events can pose direct effect on resettlements, water and physical security, economic activities and the biodiversity.

Moreover, the vulnerability index of Kuwait's coastal areas calculated centred on the lowest scenario utilizing eight parameters such as elevation, coastal slope, geomorphology, distance to 20-m isobath, population, land use, cultural heritage and transportation. It is then revealed that the northern islands of Kuwait and coastal areas along Kuwait Bay would be vastly affected while the coastal area near Shuaibah Port was the most inclined amongst the southern shorelines. These are grounded on the geographic distribution of submerged areas at a sea-level rise of 0.5 meters<sup>210</sup>. The manifestation of the increased sea-level rise would alter human habitation in the mentioned exposed areas that may trigger resettlement internally.

### **3.1.8. Lebanon**

Lebanon is situated on the eastern coast of the Mediterranean Sea. The country has an area range of 10,425 km<sup>2</sup>, with a standard size of 48 kilometers and a length of 220 kilometers. The projected impacts of climate change and adaptation measures are outlined for Lebanon's bioclimatic zones including in the area of water resources, agriculture, terrestrial and marine ecosystems, coastal system, and the socio-economic facets of climate change<sup>211</sup>.

As a result climate change, the overall agricultural production will drastically be affected and a decrease in food production is likely to occur. Also, water resources front a drop of 6% to 8% of the total volume of water resources with an increase in 1°C and 12% to 16% with a 2°C rise in temperature<sup>212</sup>. Limited availability of water and land resources in Lebanon, together with increasing development, create extra

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<sup>210</sup> Mohammad Alsahli & Ahmed Alhasem, "Vulnerability of Kuwait coast to sea level rise," *Geografisk Tidsskrift-Danish Journal of Geography*, Vol. 116, Issue 1, 2016, p. 1.

<sup>211</sup> UNDP, *Lebanon: Climate Change Adaptation*, n.d., date of access: 13 October 2019, [www.adaptation-undp.org/explore/western-asia/lebanon](http://www.adaptation-undp.org/explore/western-asia/lebanon)

<sup>212</sup> MOE, *Vulnerability and Adaptation*. n.d. Government of Lebanon, date of access: 13 October 2019, [www.climatechange.moe.gov.lb/vulnerability-and-adaptation](http://www.climatechange.moe.gov.lb/vulnerability-and-adaptation)

challenges for the country's potential growth, on the one hand, direct effects of climate on agriculture are primarily linked to drop in crop yields or failure owing to drought, frost, hail, severe storms, and floods<sup>213</sup>.

Sea-level rise of 12-25 cm in 2030 may also affect touristic places, e.g., public beaches that are used by a substantial ratio of the population, and may instigate coastal destruction and structure impairment to the national archaeological heritage, inflicting higher costs to protect and maintain waterfronts<sup>214</sup>. The spatial and sectoral links may have a pivotal role in the adjustment practices. The nature and extent of the impact will depend on the degree of exchanges with the other regions<sup>215</sup>. Moreover, the reality of sea-level rise will not directly manifest spatial movement in the country. However, agricultural fiascos may seem to prompt rural-urban movement basing on the cited challenges.

### **3.1.9. Oman**

Oman is located in Western Asia occupying the south-eastern part of the Arabian Peninsula. The country has a total landmass of 309, 500 km<sup>2</sup> and its coastline stretches nearly 1,700 km and edges three seas: the Arabian Gulf, the Gulf of Oman and the Arabian Sea. Furthermore, Oman has one of the paramount accounts in environmental conservation and pollution management measures to safeguard its territory, e.g., the ecology consisting the air and the water<sup>216</sup>.

A study on vulnerability of agrarian sector in the country shows that temperature is increasing, and rainfall too is decreasing. This has affected the production and management of crops. Different climate change impacts were recorded such as the reduction of the period of the rainy season by one month and a later onset of the precipitation period, i.e., altering from July-August to mid-September and into

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<sup>213</sup> IPCC, "Climate Change 2013 The Physical Science Basis Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change," 2013, p. 7.

<sup>214</sup> MOE, *Lebanon's Second National Communication to the UNFCCC*, Beirut: Government of Lebanon, 2011, p. 150.

<sup>215</sup> Nadim Farajalla, et al., *Climate Change in Lebanon: Higher-order Regional Impacts from Agriculture*, Issam Fares Institute for Public Policy and International Affairs, Beirut: American University of Beirut, 2014, p. 6.

<sup>216</sup> UNDP, *Oman: Climate Change Adaptation*, n.d., date of access: 13 October 2019, [www.adaptation-undp.org/explore/western-asia/oman](http://www.adaptation-undp.org/explore/western-asia/oman)

October<sup>217</sup>. The country faces climate change vulnerability such as the increased average temperatures, less and more intermittent rainfall discharges, changes in sea-level and desertification.

It is indicated that Oman's landmass may experience a reduction of approximately 0.02 to 1.8 percent due to between 1-5 meter rise. The percentage impact of sea-level rise on the GDP of the country is implied as 2.8 percent among the Arab states. Prior studies presented the high marks of ambiguities since there is no close monitoring re sea level at the highly risk places, and to add, The impacts of climate change trigger water deficit in the country because of the increased temperatures and reduced and more erratic rainfall thus the stress on the limited water resources including the quantity and quality of fresh water resources<sup>218</sup>.

### 3.1.10. Palestine

The continuing Israeli occupation, currently in its fifty-second year, inhibits Palestinians from accessing resources that track the countermeasures in supporting climate change adaptation. Moreover, to note, climate change mitigation and adaptation in several Mediterranean countries expects a decrease of annual rainfall discharge in the eastern Mediterranean region of up to 30% by the end of this century, equated with the period of 1961-1990<sup>219</sup>.

The Gaza Strip, conversely, is an ecological and humanitarian disaster area, over-abstraction of its narrow Coastal Aquifer that directed to a significant intrusion of saline water<sup>220</sup>. Precipitation is estimated to decrease by ~20% until 2055, and to ~30% by 2090. Whereas sea-level rise will quicken coastal erosion and exacerbate

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<sup>217</sup> Bheemanagoud Choudri, Ahmed Al-Busaidi & Mushtaque Ahmed, "Climate change, vulnerability and adaptation experiences of farmers in Al-Suwayq Wilayat, Sultanate of Oman," *International Journal of Climate Change Strategies and Management*, Vol. 5, Issue 4, 2013, pp. 445-454.

<sup>218</sup> Mushtaque Ahmed & Bheemanagoud Choudri, "Climate change in Oman: current knowledge and way forward," *Education, Business and Society: Contemporary Middle Eastern Issues*, Vol. 5, Issue 4, 2012, pp. 228-236.

<sup>219</sup> Zena Agha, *Climate Change, the Occupation, and a Vulnerable Palestine*, 26 March 2019, date of access: 13 October 2019, [al-shabaka.org/briefs/climate-change-the-occupation-and-a-vulnerable-palestine/](http://al-shabaka.org/briefs/climate-change-the-occupation-and-a-vulnerable-palestine/)

<sup>220</sup> Jan Selby & Clemens Hoffmann, "Water scarcity, conflict, and migration: a comparative analysis and reappraisal," *Environment and Planning C: Government and Policy*, Issue 30, 2012, p. 1005.

saltwater intrusion affecting coastal agriculture. Climate change is seen to worsen some of these challenges by impacting on several factors related to food production<sup>221</sup>. Sea-level rise, too, is a risk for displacements for coastal communities<sup>222</sup> since there is an estimated 0.6-1.6 m increase in Eastern Mediterranean by the end of this century<sup>223</sup>.

Water scarcity is particularly a serious concern in the West Bank and Gaza, due to the annual cut-rate of renewable internal freshwater reserves for its population is less than 200 cubic meters per capita<sup>224</sup>. Nonetheless, Marj Sanour watershed is reflected to be vulnerable to climate change variables since local communities economically depend on it and because of their low adaptive capabilities<sup>225</sup>.

### 3.1.11. Qatar

The State of Qatar faces multifaceted risks from several impacts induced by climate change, i.e., floods, droughts, and sand and dust storms. The country's water crisis ranks among the worst in the world, and to add, more significant precipitation variability could conclude in lengthy drought periods. It is estimated that about 677 people or 0.08% of the entire population are exposed to drought circumstances. On the other hand, about 0.01% of the population is situated within the areas flood of exposure. However, this is prospective to increase with augmented rainfall changeability and concentration<sup>226</sup>.

Qatar is particularly exposed to sea-level rise as it is apt to inland flooding of 18.2% of its landmass, at less than 5m increase in sea level, along with the associated adverse impacts on the population as 96% are living in the coastal areas<sup>227</sup>. The country

<sup>221</sup> ClimaSouth, "The Economics of Climate Change in the Palestine," *Technical Paper*, 2017, pp. 5–27.

<sup>222</sup> USAID, *Climate Change Risk in the West Bank and Gaza*, Country Risk Profile, 2017a, p. 3.

<sup>223</sup> Michael Mason, Mark Zeitoun & Ziad Mimi, "Compounding Vulnerability: Impacts of Climate Change on Palestinians in Gaza and the West Bank," *Journal of Palestine Studies*, 2012, p. 41.

<sup>224</sup> USAID, *ibid*, p. 1.

<sup>225</sup> IUCN, *Resilience to Climate Change in Palestine: The Fine Balance between Floods and Droughts*, 2013, p. 10.

<sup>226</sup> The World Bank, *Qatar Vulnerability*, n.d., date of access: 13 October 2019, [www.climateknowledgeportal.worldbank.org/country/qatar/vulnerability](http://www.climateknowledgeportal.worldbank.org/country/qatar/vulnerability)

<sup>227</sup> Laurent Lambert, "Climate Change Risks for the State of Qatar, Climate Change: Facts, Risks and Solutions," Doha: Qatar University, 2015 cited by Laurent A. Lambert & Cristina D'Alessandro, *Climate Change, Sea Level Rise, and Sustainable Urban Adaptation in Arab Coastal Cities*, 12

is impacted by intensifying sea-level, having 96% of its population living in coastal towns/cities, and there is a potential for several coastal areas to be submerged. Qatar is among the top ten countries in the world that would be most distressed by sea-level rise<sup>228</sup>.

### 3.1.12. Saudi Arabia

The Kingdom of Saudi Arabia is a state comprising of 200 million km<sup>2</sup>, indicating almost 80% of the Arabian Peninsula. It has 2,410 km of coastlines, and 1,760 km of which cover the Red Sea and 650 km show the eastern coast of the Arabian Gulf. Forest domains in Saudi Arabia cover 2.7 million hectares, and landmass stretches over 171 million hectares. The country has 35 km<sup>2</sup> of mangroves and 1,480 km<sup>2</sup> of coral reefs<sup>229</sup>.

It has a sensitive ecosystem for any impacts of climate change, particularly, on desertification processes. The climate change would elevate the levels of reference of evapotranspiration process by around 1–4.5% at 1°C increase, and by about 6–19.5% at 5°C rise in most areas<sup>230</sup>. The upsurge in temperature can differ in the scopes of 0.8–1.9°C, 0.9–3.7°C and 0.7–4.1°C. The variations in precipitations can be in the series of –33–38.1, –38.1–111.8 and –7.6–152.4 mm annually. The increase in temperatures and fluctuation configurations of rainfall can carry significant concerns on water resources and the quality, agricultural productions and farmlands water requirements<sup>231</sup>.

As for the exposure of the Red Sea with climate change, digital elevation models show that approximately 890 km<sup>2</sup> of the coastline hits below 1 meter. The

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February 2019, date of access: 10 October 2019, [www.mei.edu/publications/climate-change-sea-level-rise-and-sustainable-urban-adaptation-arab-coastal-cities#\\_ftn18](http://www.mei.edu/publications/climate-change-sea-level-rise-and-sustainable-urban-adaptation-arab-coastal-cities#_ftn18)

<sup>228</sup> Ministry of Environment, “Initial National Communication to the United Nations Framework Convention on Climate Change,” 2011, p. 15.

<sup>229</sup> El Mostafa Darfaoui & Abdu Al Assiri, *Response to Climate Change in the Kingdom of Saudi Arabia*, n.d., Food and Agriculture Organization of the United Nations, date of access: 14 October 2019, [www.fao.org/forestry/291570d03d7abbb7f341972e8c6ebd2b25a181.pdf](http://www.fao.org/forestry/291570d03d7abbb7f341972e8c6ebd2b25a181.pdf)

<sup>230</sup> UNDP, *Saudi Arabia: Climate Change Adaptation*, n.d., date of access: 14 October 2019, [www.adaptation-undp.org/explore/western-asia/saudi-arabia](http://www.adaptation-undp.org/explore/western-asia/saudi-arabia)

<sup>231</sup> Qassem Tarawneh & Shakhawat Chowdhury, “Trends of Climate Change in Saudi Arabia: Implications on Water Resources,” *Climate*, 2018, p. 16.

coastal vulnerability index specifies that about 16% of the shore has an extreme vulnerability, while 44% firmly has low exposure to climate change. High vulnerable coastal segments involve inhabited low-lying lands and coastal ecosystems, i.e., mangroves, coral reefs<sup>232</sup>. The result of the variation sea-level rise in the region is adversely affecting the current Land Use Land Cover classes taking into review the range of increase in the sea-level growth from 0-1.5 meter based on dynamics of climate change and scientific forecasts<sup>233</sup>.

With climate change, the Kingdom is exposed to a remarkable gravity of crooked climate conditions leading to high vulnerability to the result of agitated aridity, fewer precipitation discharges, and extreme temperatures; thus, the agony of acute water scarcity and the intimidation of sea-level rise. Meanwhile, the country has a large-scale dependency from fossil fuels which is generally regarded as a foremost source of greenhouse gas emissions globally that for a fact triggers climate change.

### 3.1.13. Syria

The Syrian Arab Republic is sited next to the Mediterranean Sea in the Middle East, bordering Lebanon and Turkey. The country has a hot temperature, arid climate and mild, rainy winters alongside the coastline. Some of the prevalent environmental issues in the country involve soil erosion, desertification, and an inadequate supply of potable water<sup>234</sup>. The altering of climate conditions such as the increase of temperatures instigating severe drought would mean reduction of water resources putting the communities in scarce and insecurity of the latter.

The continuing conflict has damaged the economy and has affected millions of populations which displaced an estimation of more than 10 million, and based on guesstimates, 330,000 have died in 2015. On the other hand, climatic research and ethnographic studies have shed light on the possibility that water shortages further

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<sup>232</sup> Mohamed Hereher, "Vulnerability assessment of the Saudi Arabian Red Sea coast to climate change," *Environmental Earth Sciences*, Vol. 75, Issue 1, 2016, pp. 1–13.

<sup>233</sup> Jarbou Bahrawi & Mohamed Elhag, "Simulation of Sea Level Rise and its Impacts on the Western Coastal Area of Saudi Arabia," *Indian Journal of Geo-Marine Sciences*, Vol. 45, Issue 1, 2016, pp. 54–61.

<sup>234</sup> UNDP, *Syrian Arab Republic: Climate Change Adaptation*, n.d., date of access: 14 October 2019, [www.adaptation-undp.org/explore/western-asia/syrian-arab-republic](http://www.adaptation-undp.org/explore/western-asia/syrian-arab-republic)

threatening the agrarian productivity since most crops are rain-fed and climate variability contributed to the conflict<sup>235</sup>. Recently, long drought has severe consequences for farmers and livestock in northeast Syria. The livelihoods of more than 1 million residents in these provinces have been impacted. Hundreds of thousands had to abandon their rural way of living and move to urban areas to look for jobs<sup>236</sup>.

Climate change is strongly perceived as a ‘threat multiplier’ for insecurity in the year to come aside from the prevailing conflict in the country. Taking also to note that, climate change is also an instrumental factor in the extreme drought experienced in the country preceding to its civil war; this drought in turn led to massive migration; hence, in turn impaired the socio-economic pressures that fortified Syria’s background of civil conflicts<sup>237</sup>. Furthermore, increasing sea-levels are likely to conclude in flooding of low-lying Syrian coastal plains, causing erosion and daunting critical coastal structures and agricultural lands. Saltwater intrusion could contaminate groundwater aquifers<sup>238</sup>.

#### **3.1.14. Turkey**

Turkey is extremely vulnerable to the impacts of climate change. Being in the southern belt of Mediterranean Europe, the country is already confronting an experiential warming inclination in temperatures and a robust decreasing tendency in precipitation. It creates a direct effect on the water requirement for food production and rural development. Moreover, rising temperatures combined with the declining rainfall will prime acute water insecurity in the southern and western parts of the country. This condition will be worsened by sudden rising demand, particularly from farmers, and assessing that closely 20% of the surface water in several basins will be lost by 2030<sup>239</sup>.

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<sup>235</sup> USAID, *Climate Change Risk Profile: Syria*, 2017b, p. 1.

<sup>236</sup> The World Bank, “CHAPTER 1: Climate Change Is Happening Now, and People Are Affected in Arab Countries,” *Adaptation to a Changing Climate in the Arab Countries*, Ed. Dorte Verner, Washington D.C.: World Bank, 2012, p. 17.

<sup>237</sup> Jan Selby, Omar Dahi, Christiane Frohlich & Mike Hulme, “Climate change and the Syrian civil war revisited,” *Political Geography*, Vol. 60, 2017, pp. 232–244.

<sup>238</sup> USAID, *ibid*, p. 4.

<sup>239</sup> UNDP, *Turkey: Climate Change Adaptation*, n.d., date of access: 14 October 2019, [www.adaptation-undp.org/explore/western-asia/turkey](http://www.adaptation-undp.org/explore/western-asia/turkey)

In an analysis of the environmental and social impacts of climate change in the Konya, including their implications for the mobility of farmers and their agricultural productivity, migration in the region is strongly influenced by social injustice and inequality in the area. The combination of existing social inequalities and increased environmental risks due to climate change will only make farmers more vulnerable, and high levels of out-migration from the region are going to continue<sup>240</sup>.

Internal environmental migration and displacement has been relatedly recounted in the country, as climate change impacts the agricultural industry and other sectors that are reliant on it. IOM indicated in their reports that between 1960 and 2010 temperatures have been increasing to more than 40°C in the summer seasons, while fluctuating precipitation patterns have caused in increased rainfall discharges in north-eastern part of the country and decreased amount of precipitation in the west<sup>241</sup>.

Floods are unavoidable in the parts of the country of low elevation, like coastal areas. There are several low-lying coastline areas where it clumps the cities, featuring populations and industrial regions at high risk by the coastal erosion due to the upsurge of the sea level and also incited by extreme precipitations<sup>242</sup>. On a serious take, damage in livelihood such as in agriculture and destruction caused by increasing sea-level, all induced by climate change, may highlight the risk of population distress stirred migration.

### **3.1.15. Turkish Republic of Northern Cyprus**

The Turkish Cypriot leadership unilaterally affirmed the region in Northern Cyprus a sovereign state on the 15<sup>th</sup> of November 1983 following “Turkish Republic of Northern Cyprus” as its country name<sup>243</sup>. Notwithstanding the point that this

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<sup>240</sup> Gülçin Erdi Lelandais, “Drought, Social Inequalities, Adaptation, and Farmers’ Mobility in the Konya Plain of Turkey,” *Environmental Migration and Social Inequality*, 2016, pp. 91–102.

<sup>241</sup> Tina Čadež & Mariana Hernandez Hevia, “Environmental migration in Turkey: Challenges, recognition and implications for policy,” *Migration, Environment, and Climate Change: Policy Brief Series*, Vol. 8, Issue 2, 2016, pp. 8-9.

<sup>242</sup> MEU, *Turkey’s National Climate Change Adaptation Strategy and Action Plan*, Ankara: Republic of Turkey, 2011, p. 28.

<sup>243</sup> Muhittin Tolga Özsağlam, “Limited Recognition and Limited Relations: TRNC,” *Yönetim ve Ekonomi Araştırmaları Dergisi*, 2018, pp. 314-328.

undertaking has been denounced by the United Nations and that only Turkey has accepted it.

Furthermore, just like the setting of Northern Cyprus in terms of the impacts of climate change, the temperature increase in TRNC is discerned to be 0.45°C per year between 1980 and 2004. TRNC, therefore, is reeling from a shortage of water sources. It is also worth to note that ten streams originating from the mountains of Trodos in Southern Cyprus run transversely to Northern Cyprus, but, most of these are managed by dam facilities of the Southern Cyprus<sup>244</sup>. Water shortages have been challenging the agricultural sector particularly in the Citrus industry due to a considerable stress upon the inadequate water resources<sup>245</sup>.

The climate change instigated Sea-level rise is similarly seen to disturb coastal areas reflecting that TRNC is sited in the Mediterranean, sharing its land with Northern Cyprus<sup>246</sup>. Littoral submergence is the impact of intense water level occasions because of gigantic waves, storm surges and tidal currents, merged all together. This natural event may enormously be elicited by the vast alteration in the climate. Nonetheless, increased in the sea-level would be perceived a manifestation of displacements and damage to infrastructure and to the economy in general.

### 3.1.16. Cyprus<sup>247</sup>

Cyprus, a small island state placed in the south-east Mediterranean, having a semi-arid climate setting and hot summer and mild winter seasons. Water shortage is seen to be the sternest problem noting that the inland-state is geographically positioned

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<sup>244</sup> Esra Pakin Albayrakoğlu, "Climate Change and Security: The Case for Turkey," *Akademik Bakış*, 2011, p. 70.

<sup>245</sup> Clare Finnegan & Omer Gokcekus, "Sustainable Climate Change Adaptations in Developing Countries: A Case Study of the Turkish Cypriot Community's Adoption of Pomegranate Farming," *The Sustainability of Agro-Food and Natural Resource Systems in the Mediterranean Basin*, 2015, p. 162.

<sup>246</sup> IPCC, *ibid*, p. 151.

<sup>247</sup> Cyprus is recognized as a sovereign state by the United Nations whilst the Turkish Republic of North Cyprus is solely acknowledged by Turkey as an independent state. The data provided as per Cyprus in this study is exclusively adherent to the Republic of Cyprus. TRNC, on the one hand, will be handled as an independent state considering the study is conducted in Turkey.

on an arid landscape. Climate change is perceived to source out substantial temperature rise and a significant drop in the rate of rainfall discharges.

The country has already undergone various environmental changes, whether in temperature and precipitation, and calculations illustrate the intensity of the current situation. Climate change's major sways are at the most exposed sectors, i.e., water resources, ecosystems and biodiversity, forests, agriculture, human health, coastal zones, energy supply and demand, tourism, and social impacts<sup>248</sup>.

Climate change impacts are seen to exacerbate coastal zones. Coastal water submerging is expected to affect the Mediterranean considerably; multiplying damages from flooding and extreme events such as storm surges and tsunamis are projected<sup>249</sup>. A prospective sea-level rise would impair seawater intrusion to the coastal aquifers, while lower recharge frequencies may intensify the concentration of pollutants<sup>250</sup>.

The prospect of coastal flooding alone is a primary driver of population movement if coastline communities are severely disturbed. Coastal submerging is often the result of extremely high water level events due to the combined contributions of enormous waves, storm surges and enormous currents. It may create a short-term displacement pattern which is conditional contemplating on the extent of socio-economic damage it can construct. Water scarcity, too, in the country can evolve as a plus factor to induce minimal spatial movement constituting the lesser ratio of the affected population.

### **3.1.17. United Arab Emirates**

While the United Arab Emirates had adapted soundly from the severe desert settings and the country has extraordinarily thrived despite the climate condition. In contrast, future impacts of climate change may inflict contemporary and tremendous

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<sup>248</sup> Theodoros Zachariadis, "Chapter 3: Climate Impacts, Climate Change in Cyprus Review of the Impacts and Outline of an Adaptation Strategy," *Briefs in Environmental Science*, Springer, 2016, p. 25.

<sup>249</sup> IPCC, "Climate change 2014: Synthesis report," *Fifth Assessment Report*, 2014, p. 151.

<sup>250</sup> Christina Papadaskalopoulou, "Assessment of Cyprus vulnerability to climate change," *Adapt to Climate Change Conference*, 2014, p. 8.

weights on the UAE's environment, economy and its society. On top of that, climate forecasts reveal an increased temperature and humidity levels in the country and along the Arabian Gulf, lengthy hot and humid seasons, more severe precipitation discharges, rising sea-levels, and augmented chance and scale of extreme weather events<sup>251</sup>.

Research has found that in 2009, 332 km<sup>2</sup> of the emirates of Ajman, Sharjah and Umm Al Quwain lie less than 10 meters above sea level. It goes to show that there is a conceivable risk of increased sea-level because of global warming in the Arabian Gulf<sup>252</sup>. The gathered data regarding the sea-level rise from 11 stations in the Arabian Gulf indicates increasing levels. Increased sea surface temperature may direct higher peaks of storm waves, augmented cyclone concentration, and a more significant threat of coastal disasters<sup>253</sup>.

Warmer waters also undermine temperature-sensitive functioning coastal environment. Coastline areas may perceive variations in storm frequency, strength, and movement. In terms of ocean warming, escalating sea-surface temperature will imply thermal increase and fluctuations in mean sea-level. On account of the absence of topographic relief and low altitude, this lets seawater to move several kilometres inland during high tide and storm surges. It may even advance inland with the risk of potential sea-level expansions. Without sufficient adaptation measures, sabkhas human and faunal populations may have to move inland<sup>254</sup>.

### 3.1.18. Yemen

Yemen has three major sectors that are susceptible to the impacts of climate change, such as water resources, agricultural production, and coastal communities. The country has an arid climate since it is located in the Middle East. Besides, more than 75% of the total population is living in rural areas, and most of whom are active

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<sup>251</sup> MECC, "UAE Climate Risk Assessment & Adaptation Measures in Key Sectors Health, Energy, Infrastructure & Environment," *National Climate Change Adaptation Program*, 2019, p. 9.

<sup>252</sup> Abul Salam, "Climate change: the challenges for public health and environmental effects in UAE," *WIT Transactions on Ecology and The Environment*, Vol. 193, 2015, p. 463.

<sup>253</sup> EAAD, "Climate Change: Impacts, Vulnerability & Adaptation," 2009, p. 22.

<sup>254</sup> EAAD, *ibid*, pp. 22–29.

in farming and pastoralism and hence high reliance on favourable climatic situations for their livelihoods. Another point worth noting is the vulnerability of Yemen to climate-related consequences, i.e., severity drought, extreme flooding, pests, disease outbreak, variations of precipitation patterns, increased storm incidences and the risk of sea-level augmentation<sup>255</sup>.

Within rural areas, nonfarm households have higher food insecurity percentages than farm households, and the continuing conflict has been hitting the country's economy, especially the marginalized sector. With climate change, the agriculture sector is having a hard time since it largely depends on primitive methods, i.e., frequent rain discharges<sup>256</sup>. The variabilities in precipitation patterns will induce food security because of the mounting severity of droughts and floods. In October 2008, flood impairment inflicted costs equal to 6% of GDP. Rising sea levels are likely to quicken coastal erosion, to cause critical infrastructure loss, to impend marine bio-diversities including low-lying coastline wetlands and to force community relocations or environmental displacement<sup>257</sup>.

### **3.2. Environmental Migration Trends in the Middle East**

Migration trends in the Middle East are frequently determined by human-made adversities such as the decade-long wars that prompted hundreds of thousands of displacement and forced population movement in Syria, Iraq and other parts of the region not to mention the plight of the region from the countless terror assaults constructed by the existing extremist groups in the region. The disposition of forced migration caused by conflicts remains to be a significant component of the socio-political instability in the region.

According to experts, the reality of climate change can stretch the magnitude of the outlook of migration in the Middle East. It can undermine the capacities of each

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<sup>255</sup> UNDP, *Yemen: Climate Change Adaptation*. n.d., date of access: 14 October 2019, [www.adaptation-undp.org/explore/western-asia/yemen](http://www.adaptation-undp.org/explore/western-asia/yemen)

<sup>256</sup> Hadil Mohamed, Moosa Elayah & Lau Schuplen, "Yemen between the Impact of the Climate Change and the Ongoing Saudi-Yemen War: A Real Tragedy," Analytical Report, 2017, p. 1.

<sup>257</sup> CIF, "Pilot Programme for Climate Resilience," 2012 cited by Ministry of Foreign Affairs, "Climate Change Profile: Yemen," 2018, p. 4.

state to handle a pace distinct from any human-made disaster they fronted. Climate change fast-tracks the spiralling of social vulnerability and the worsening predispositions of resource scarcity and displacements. For instance, the extreme drought that hit Syria long before the civil conflicts is contemplated as an environmental predicament that led to a largescale population movement in which climate change may have been an instrumental factor in its severity.

**Table 3.1. Climate-related environmental stressors and its risks in the Middle East**

<b>Stressors</b>	<b>Risks</b>
Increased temperatures and severe drought	<ul style="list-style-type: none"> <li>– reduced water resources</li> <li>– decreased agricultural activity (food insecurity)</li> <li>– increased water scarcity</li> </ul>
Decreased average precipitation	<ul style="list-style-type: none"> <li>– decreased groundwater recharge</li> <li>– decreased agricultural productivity (food insecurity)</li> <li>– increased water scarcity</li> </ul>
Sea-level rise	<ul style="list-style-type: none"> <li>– soil erosion</li> <li>– saltwater intrusion</li> <li>– human resettlement / displacement</li> <li>– damage to infrastructures</li> </ul>
Floods (due to extreme amount of rainfall discharge)	<ul style="list-style-type: none"> <li>– damage to infrastructures</li> <li>– temporary human resettlement</li> </ul>

It is noteworthy to elaborate that the case of almost all the countries in the Middle East are suffering from water scarcity and insecure agriculture production because of the severity of temperature and the unfavorable patterns of precipitation discharges since most agrarian lands are rain-fed, one of the existing fallouts of climate change. Reduced precipitation rates would equate to lower groundwater recharge, so does high temperatures would mean an upsurge in demand for water consumption, and hence abstraction rates.

Table 3.1. Describes that the increased in temperatures and deterioration in annual precipitation discharge and more severe and frequent drought events will likely decrease agricultural produces; diminishing soil quality and lower cut-rate of water resources pose a direct impact on agricultural productivity. Furthermore, robust precipitation events and flooding may also inundate and damage agricultural land and produce.

Water scarce plus the unsteady agricultural production because of increasing desertification in an already arid region may end up to a food-insecure society that may likewise lead to flee to survive to deliberate that the local environment is incapable of supporting their livelihood and their basic needs.

Food and water resources, when insecure, can also activate population movement. FAO elaborated that forced migration specifies a responsive move of concluding option to survive from an event that is deemed challenging a person's safety, security, and livelihood in the place of origin. Displacement, similarly, may occur due to war or civil conflict, in retort to extreme environmental events and natural calamities<sup>258</sup>.

Sea-level rise, on the other hand, is perceived to be an emerging climate-related dilemma in the Middle East, particularly in the Arabian Gulf and Mediterranean region. It may result in saltwater intrusion damaging soils and coastline agrarian lands. Coastal communities are seen being provoked by increasing sea-level rise leading to coastal flooding, which may conclude to resettlement and potential displacement.

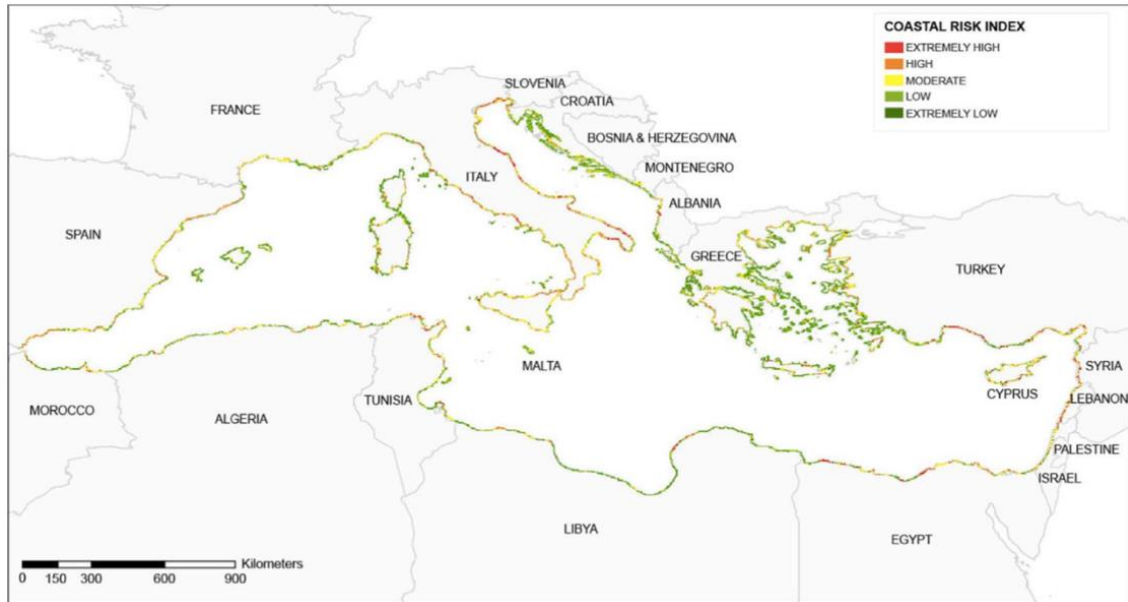
The World Bank speculates that a half-meter sea-level rise is anticipated to flood 30% of Alexandria in Egypt resulting to the displacement of 1.5 million inhabitants and perhaps the figure may increase varying on magnitude of the disaster. In the same given scenario, about 195,000 workplaces and projected costs to land and property are likely to reach US\$ 30 trillion<sup>259</sup>.

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<sup>258</sup> UNFAO, *Forced migration and protracted crises: A multilayered approach*, Guidance Note, Rome: FAO, 2017, p. 1.

<sup>259</sup> The World Bank, *ibid*, p. 15.

**Figure 3.2. Coastal Risk Index map of the Mediterranean, spatially depicting five levels of risk.**



Source: Alessio Satta, Manuela Puddu, Sara Venturini & Carlo Giupponi, “Assessment of coastal risks to climate change related impacts at the regional scale: The Case of the Mediterranean Region,” *International Journal of Disaster Risk Reduction*, 2017, p. 292.

Figure 3.2. expresses that Syria, Lebanon and Egypt, with standards of more than 20%, it goes to interpret that they are the most exposed countries to risk from coastal erosion and coastal flooding. Countries with highest concentration of “extremely high” risk standards are primarily situated in the eastern Mediterranean region, and that includes Cyprus and other countries<sup>260</sup>.

As for the sea-level rise in the Persian Gulf, it indicates that 50 cm rise by 2050 across the globe may also affect particularly the Arabian Sea and Persian Gulf region, where most economic centers are located in several coastal cities, i.e., Abu Dhabi, Doha, and Dubai that are critically on low-lying coastal zones or islands<sup>261</sup>. As a result of increasing sea-level rise, the most vulnerable areas in the Middle East are Qatar, Bahrain, Kuwait, Iraq including the Nile Delta of Egypt putting aside from the

<sup>260</sup> Alessio Satta, et al., *ibid*, p. 293.

<sup>261</sup> Laurent A. Lambert & Cristina D’Alessandro, *ibid*.

conceivable impacts of climate change such as the increasing temperatures and reduced rainfall discharges in the a region that suffers from already arid climate and water insecurity<sup>262</sup>.



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<sup>262</sup> Mohamed El Raey, *ibid*, p. 14.

## CHAPTER IV

### MITIGATION AND ADAPTATION STRATEGIES ON ENVIRONMENTAL MIGRATION IN SOUTHEAST ASIA AND THE MIDDLE EAST

The rapid change of the course of climatic conditions, environmental changes, including societal transformations triggered by population growth and urban development, would imply that population and vulnerable communities, because of the intensities of these changes, may no longer be able to mitigate the impacts. However, adaptation supported by scientific advancement and political strategies can make a difference in altering the conclusion of climate change and other factors.

However, there is a continuous apprehension unfolding migratory movement relating to intense environmental factors backed by the substantial changes in the climate and the environment. On account of the multi-layered causality of migration, the awareness and stimulus of an individual may differ according to the existent factors they experience. Furthermore, converging on environmental migration as social reaction that may arise because of climate change and environmental changes, it may demand mounting mitigation and adaptive measures primarily from the grassroots levels. Of course, it has to be supported in the national level and international organizations, civil society institutions and private sectors may assist as well.

Scholars' views vary over whether the adaptive welfares of migration offset the 'costs' to the grassroots communities. Recent studies undertaking migration, methodological choices may have inadvertently led to inaccuracies as interview and survey participants reflect false assumptions about their counterparts in the migration process. Migration remains to be depicted in public deliberations as a fiasco to adapt to changes, although legislators study several adaptation methods as a way to condense migration demands. Also, scholars have argued that migration progressions occur within a greater context of strategies for adapting to the detrimental upshots of climate change impacts<sup>263</sup>.

To better realize the prospective conclusions of climate change, it may necessitate a transference in the migration research structure towards a more precise

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<sup>263</sup> François Gemenne & Julia Blocher, "How can migration serve adaptation to climate change? Challenges to fleshing out a policy ideal," *The Geography Journal*, 2017, pp. 1–9.

focus on internal migration, and highlighting more on understanding climate-induced and environmentally-motivated movement where most migration is likely to take place in developing countries that lack policy strategies with the latter.

Nonetheless, IOM argued that it is challenging to convince policymakers regarding the importance of climate change linked migration without consistent data. Some procedures can improve figures on environmental migration, beginning with the instituting of a special commission involving data experts in the field of migration, environment, development, and humanitarian other areas. They are tasked to expand new practical means of crafting a better use of records and developing contemporary indicators of environmental migration<sup>264</sup>.

On policy-associated stance, it is necessary to discern the path of environmental migration on the political table more certainly in the regions of Southeast Asia and the Middle East, knowing for a fact that both are reeling from the impacts of climate change, therefore, eliciting population movement. Approaches rendering mitigation and adaptation measures on environmental migration and other related strategies enacted are unequivocally interpreted in this chapter.

#### **4.1. Global Climate Initiatives**

The initial practise of global governance carries out as a strong point for discerning the sources and political implications of global change. It deals with a more complex and intricate structures than other systems do, i.e., the processes dealing with globalization<sup>265</sup>. The international community has been progressively attempting to tackle the complexity of climate change for migration, the capability of current organizations, national governments per se in managing the wide-ranging movement of populations induced by the latter. Based on recent shreds of evidence, abrupt environmental changes have triggered displacements is most parts of the world, specifically in Southeast Asia and the Middle East.

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<sup>264</sup> IOM, *ibid*, p. 30.

<sup>265</sup> Sverker Jagers & Johannes Stripple, "Climate Governance Beyond the State," *Global Governance*, Vol. 9, Issue 3, 2003, pp. 385–399.

Environmental governance incorporated at the national and regional levels, is critical to achieve sustainable development goals. Strengthened environmental governance should be in place at all political levels to retort briefly and efficiently defying the emerging environmental challenges, and to established environmental priorities<sup>266</sup>.

With that mentioned, global climate governance depicts climate management through extensive environmental policies aligned with diplomacy sought to disentangle the aftermaths of climate change and its driven impacts such as food insecurity, sea-level rise, rising temperature, extreme weather conditions supplemental to the unprecedented population movement. To realize such, it demands all-out global cooperation among players plotting to develop an inclusive collaboration that will thwart climate change a global issue.

IPCC reiterated in their synthesis report that, there is no appropriate paramount set of policies; relatively, it is imperative to reflect both the robustness of different strategy methods against a variety of risks in the future and the degree to which such climate-related policies can be incorporated with broader sustainable development policies<sup>267</sup>. The intensity of environmental interferences, somehow, varies from region to another. Such may also sway the national and local governments from adaptive and mitigative mechanisms adverse to the severity of climate impacts.

The arising of UNFCCC was fostered in the adoption of the “Rio Convention” or the “1992 Earth Summit” of the Conference of Parties (COP). The Rio declaration stipulates states to cooperate to make the economic system to be adopted by the states an open economic system that supports economic growth and sustainable development worldwide<sup>268</sup>. Additionally, the Rio+20 result dubbed as the “The Future We Want”, emphasizes the weight of an institutional framework with regard to sustainable development and operative governance at local, sub-national, national and global

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<sup>266</sup> Esra Banu Sipahi, “Küresel Çevre Sorunlarına Kolektif Çözüm Arayışları ve Yönetişim,” *Selçuk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, Sayı: 24, 2010, pp 332–344.

<sup>267</sup> IPCC, *ibid*, p. 1.

<sup>268</sup> Ruşen Keleş, *100 Soruda Çevre, Çevre Sorunları ve Çevre Politikası*, İzmir: Yakın Kitabevi, 2013, p. 131.

levels, and similarly, a comprehensive public involvement, and availability of information, and influential judicial and administrative proceedings<sup>269</sup>.

It marks the substantial efforts of structuring global climate governance since the framework involves to be strident on shaping universal climate policies in the reduction of global greenhouse gas emissions then advancing human and environmental security on a global scale. Conference of Parties, on the one hand, inclines to pivot on the prime intimidation to global security in the 21st century by climate change. Its fulfillment varies from the proactive partaking of Parties therein dwelling on the interests serving their respective states. The materialization of climate change-related policies is tantamount to the mitigation of the surfacing of migration opted by extreme environmental changes.

In 1997, the Kyoto Protocol was finalized in Japan, aiming to reinforce emission cutbacks. It emphasizes intentionally on the prospective economic and environmental bearings of the methods corresponded to at the conference aligned with suitable parties' responses rendering from their respective governments. The treaty introduced three profound mechanisms, which are stretchily suggesting Parties with flexible in meeting their respective limitations in emitting GHGs: (a) joint implementation; (b) clean development mechanism; and (c) emissions trading<sup>270</sup>. The likelihood of compliance with the Protocol can be of greater extent increased by complex procedures which demands to have a potentially accurate and comparable data as provided by states and assessment will take place by independent experts with the participation of the public<sup>271</sup>.

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<sup>269</sup> Zerrin Savaşan, "Advancing Global Environmental Justice through Environmental Networks," *Relationes Internationales, Acta Universitatis Danubius*, Vol. 10, No. 2. 2017, pp. 5–19.

<sup>270</sup> UN, *Kyoto Protocol to the United Nations Framework Convention on Climate change*, Kyoto: UN, 1997, pp. 6-15.

<sup>271</sup> Zerrin Savaşan, "Climate Change, Compliance and the Role of Reporting: A Comparative Analysis of Reporting under the Montreal and Kyoto Protocols," *World Congress on Water, Climate and Energy*, 2012, pp. 1–11.

**Table 4.1. Parties ratified the Paris Agreement in the Middle East and Southeast Asia**

<b>Country</b>	<b>Region</b>	<b>Date of Ratification</b>
1. Bahrain	Middle East	23 December 2016
2. Brunei Darussalam	Southeast Asia	21 September 2016
3. Cambodia	Southeast Asia	6 February 2017
4. Cyprus	Middle East	4 January 2017
5. East Timor	Southeast Asia	16 August 2017
6. Egypt	Middle East	29 June 2017
7. Indonesia	Southeast Asia	31 October 2016
8. Iran	Middle East	<i>-pending-</i>
9. Iraq	Middle East	<i>-pending-</i>
10. Israel	Middle East	22 November 2016
11. Jordan	Middle East	4 November 2016
12. Kuwait	Middle East	23 April 2018
13. Lao PDR	Southeast Asia	7 September 2016
14. Lebanon	Middle East	<i>-pending-</i>
15. Malaysia	Southeast Asia	16 November 2016
16. Myanmar	Southeast Asia	19 September 2017
17. Oman	Middle East	22 May 2018
18. Palestine	Middle East	22 April 2016
19. Philippines	Southeast Asia	23 March 2017
20. Qatar	Middle East	23 June 2017
21. Saudi Arabia	Middle East	3 November 2016
22. Singapore	Southeast Asia	21 September 2016
23. Syria	Middle East	13 November 2017 ( <i>accession</i> )
24. Thailand	Southeast Asia	21 September 2016
25. Turkey	Middle East	<i>-pending-</i>
26. TRNC	Middle East	-not recognized by UN-
27. United Arab Emirates	Middle East	21 September 2016 ( <i>acceptance</i> )
28. Vietnam	Southeast Asia	3 November 2016 ( <i>approval</i> )
29. Yemen	Middle East	<i>-pending-</i>

Source: UN, *Treaty Collection: Status of Ratification*, n.d., date of access: 14 October 2019, [treaties.un.org/doc/Publication/MTDGS/Volume%20II/Chapter%20XXVII/XXVII-7-d.en.pdf](https://treaties.un.org/doc/Publication/MTDGS/Volume%20II/Chapter%20XXVII/XXVII-7-d.en.pdf)

In 2012, the commitments under the Kyoto Protocol concluded and greater number of countries did not meet their emissions cutback targets, thus, the agreement was claimed to be a failure in curbing the gas emissions. Most would argue that the agreement's failure is due to the deficiencies in the structure of the pact among others<sup>272</sup>. However, with series of COP meetings, Paris Agreement proceeded in 2015

<sup>272</sup> Christopher Napoli, "Understanding Kyoto's Failure," *SAIS Review of International Affairs*, Vol. 32, No. 2, 2012, pp. 183-196.

targeting to reinforce the global climate change response by a cumulative capacity of all states to adapt to the adverse effects of climate change and promote climate resilience environment for all<sup>273</sup>. This international agreement is now the center of global climate governance enterprise, for it aims to fortify global security, human security, and environmental security. To whatever extent, the latter demands far-reaching joint action from the Convention of Parties to realize its purpose, to lessen the impact of climate change.

As of this time and date, out of 197 signatories to the Paris accord, 187 Parties have ratified<sup>274</sup>. Iraq, Iran, and Yemen are yet to ratify the international pact as they opt to consider the stature of their national interest. The Syrian Arab Republic, conversely, is at the accession stage wherein it displays the agreement to become a party to the Paris Agreement. At the same time, the United Arab Emirates' stature is at the acceptance phase. Vietnam's position is still at the purge of the government's approval to ratify the latter.

Turkey, on a considerable stance, withdrew its request to opt out of the Annex 1 list. And ahead of the summit, Turkey again requested access to climate finance and reclassification as a developing country, yet, in past years, informal negotiation channels opened, at COP23 held two years ago, Germany was assigned to facilitate the country's demands<sup>275</sup>.

The treaty outlines a global goal on adaptation which intends to target an enhancement of adaptive capacity and resilience, reduction of vulnerability, to support sustainable development initiatives, and to safeguard a suitable adaptation response in the framework of the objective of holding average global warming below 2°C and upholding determinations to lessen it under 1.5°C<sup>276</sup>.

This international accord has come into view as one of the leading international treaties. Global scholars, practitioners and policymakers have considered that the pact embodies a contemporary approach in response to climate change, be able to come up

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<sup>273</sup> UNFCCC, New elements and dimensions of adaptation under the Paris Agreement (Article 7), n.d., date of access: 14 October 2019, [unfccc.int/topics/adaptation-and-resilience/the-big-picture/new-elements-and-dimensions-of-adaptation-under-the-paris-agreement-article-7](https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/new-elements-and-dimensions-of-adaptation-under-the-paris-agreement-article-7)

<sup>274</sup> UN, *ibid*.

<sup>275</sup> İklim Haber, *Türkiye EK 1'den Çıkma Talebini Geri Çekti*, 2 Aralık 2019, date of access: 7 February 2020, [www.iklimhaber.org/turkiye-ek-1den-cikma-talebini-geri-cektili/](http://www.iklimhaber.org/turkiye-ek-1den-cikma-talebini-geri-cektili/)

<sup>276</sup> United Nations, "Paris Agreement," Treaty, 2015, pp. 2–4.

with a substantial reduction of CO<sub>2</sub> discharges. It may also enlightenment in global governance traversing border problems.

The “National Adaptation Programmes of Action (NAPAs),” to some extent, is the underlying adaptation arrangement acknowledged for the LDC (Least Developed Countries), hence, the crafting of the “Least Developed Countries Fund (LCDF)” under the UNFCCC focusing to deliver the actual needs of exposed developing countries to the detrimental results of climate change. NAPA is relatively action-oriented, country driven, and are flexible basing on the country’s conditions. Policymakers and the public are capable of understanding the reports since it is detailed in a comprehensive yet basic format, thus, making it easy to address compelling and actual adaptation requirements<sup>277</sup>. Among the countries subjected to this monetary aid are Myanmar, East Timor, Cambodia, and Lao PDR of Southeast Asia and Yemen is lone country in the Middle East particularized in the LDC list<sup>278</sup>.

**Table 4.2. Financed Adaptation Projects and Programmes through AF in the Middle East and Southeast Asia**

Country	Project/Programme	Implementing Agency	Approved Amount in USD
1. Cambodia	“Enhancing Climate Resilience of Rural Communities Living in Protected Areas of Cambodia”	UN Environment Programme	4,954,273
2. Egypt	“Building Resilient Food Security Systems to Benefit the Southern Egypt Region”	UN World Food Programme	6,904,318
3. Indonesia	“Community Adaptation for Forest-Food Based Management in Saddang Watershed Ecosystem”	Partnership for Governance Reform (Kemitran) of Indonesia	835,465
4. Iraq	“Building Resilience of the Agriculture Sector to Climate Change in Iraq”	International Agricultural Dev Fund	9,999,660
5. Jordan	“Increasing the resilience of poor and vulnerable communities to climate change”	Ministry of Planning and International Cooperation	9,226,000

<sup>277</sup> UNFCCC, *National Adaptation Programmes of Action*, n.d., date of access: 10 December 2019, [unfccc.int/topics/resilience/workstreams/national-adaptation-programmes-of-action/introduction](http://unfccc.int/topics/resilience/workstreams/national-adaptation-programmes-of-action/introduction)

<sup>278</sup> see: the list of LDC as of December of 2018 at UN, *List of Least Developed Countries (as of December 2018)*, 2018, Committee for Development Policy, date of access: 10 December 2019. [www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/ldc\\_list.pdf](http://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/ldc_list.pdf)

6. Lao PDR	“Building climate and disaster resilience capacities of vulnerable small towns in Lao PDR”	UN-Habitat		5,500,000
	“Enhancing the climate and disaster resilience of the most vulnerable rural and emerging urban human settlements in Lao PDR”	UN-Habitat		4,500,000
7. Lebanon	“Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCAL)”	International Agricultural Dev	Fund	7,860,825
8. Myanmar	“Addressing Climate Change Risks on Water Resources and Food Security in the Dry Zone of Myanmar”	UN Programme	Development	7,909,026

Source: Adaptation Fund, “Projects and Programmes,” n.d., date of access: 25 December 2019, [www.adaptation-fund.org/projects-programmes/](http://www.adaptation-fund.org/projects-programmes/)

Based on the systems of these projects and programmes, most are embedded to climate resilience programs for vulnerable and underprivileged communities covering food and water security enterprises and enhancing the capacities of rural communities to have access climate-resilient and sustainable agriculture. This financial aid also paves way to the inclusion of raising awareness to the adverse impacts of climate change, environmental protection and disaster resilience initiatives.

All these socio-environmental enterprises on food and water security, climate and disaster resiliency have direct and indirect weight on precautionary methods to the course of population movement, because an ecologically insecure local environment may potentially drive its inhabitants to move to other places where they feel invulnerable and their livelihood is not at stake.

‘Adaptation Fund (AF)’ was as well introduced back in 2001 to finance factual adaptation projects and programmes in developing countries that joined the Kyoto Protocol and are extremely susceptible to the impacts of climate change. This financing venture for climate change adaptation has committed 720 million USD since 2010 and aiding support for 100 substantial adaptation enterprises with roughly 8.7 million direct beneficiaries<sup>279</sup>.

<sup>279</sup> Adaptation Fund, *Governance*, n.d., date of access: 25 December 2019, [www.adaptation-fund.org/about/governance/](http://www.adaptation-fund.org/about/governance/)

Adaptation further explains that it adheres to modifications in ecological, social, or economic systems in reaction to particular or projected climatic stimuli and its impacts. It insinuates changes in methods, practices, and arrangements to reduce the hypothetical impairments or to take advantage of the changes associated with the latter<sup>280</sup>.

Recognizing the course of environmental migration, the ‘World Development Report 2010’ re “Development in a Changing Climate” have acknowledged migration as one of the critical subjects the Secretariat of the Swedish “Commission on Climate Change and Development (CCCD)” in partnership with the World Bank’s team to investigate further in an incisive policy brief. It indeed requests that the results be conveyed in the form of concrete references for policymakers on how to support mobility as an operational adaptation approach<sup>281</sup>.

As for mitigation strategies, climate mitigation is an increasingly crucial policy priority on a global scale. Climate mitigation policies are improbable to incite a substantial effect on how environmental change impacts the drivers of migration by 2030<sup>282</sup>, and climate policies can be more operational when steadily entrenched within broader strategies proposed to build national and regional development tracks more sustainable<sup>283</sup>. Speedy implementation is deemed compulsory to fall off climate impacts as a pre-long-term solution and to by-pass feasible largescale agitation to economies, to local communities, and its consequential outturns to migration arrangements.

#### 4.2. Political Strategies at the National Level

Countries with most climate vulnerabilities tend to build strategies that highlight mitigation and adaptation policies in coping with the results of unfavourable environmental variations, particularly in times of disaster. Policies are expressly bound

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<sup>280</sup> UNFCCC, *What do adaptation to climate change and climate resilience mean?*, n.d., date of access: 25 December 2019, [unfccc.int/topics/adaptation-and-resilience/the-big-picture/what-do-adaptation-to-climate-change-and-climate-resilience-mean](https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/what-do-adaptation-to-climate-change-and-climate-resilience-mean)

<sup>281</sup> CCCD & The World Bank, *Accommodating Migration to Promote Adaptation to Climate Change*, Ed. Jon Barnett and Michael Webber, 2009, p. 3.

<sup>282</sup> The Government Office for Science, *ibid*, p. 135.

<sup>283</sup> IPCC, “Climate Change 2001: Synthesis Report,” Summary for Policymakers, 2001, p. 4.

to take hold of the management of human actions and to inhibit the dividing line on human activities. Having expressed that, the features of environmental policy are majorly steered with the intent of averting, minimizing, and mitigating human undertakings in destroying the environment; thus, most governments have introduced the cutback of the production of greenhouse gases as it stirs up climate change.

Governments, closely, are inclined to develop climate action plans to serve as a comprehensive trajectory of adaptation mechanisms consequential to the attempt of mitigating the ramifications of climate change. For that reason, the surfacing of climate-linked disasters has expanded the substance of environmental politics in the globe, especially in the region of Southeast Asia, but not so in the Middle East, given their political engagements on the latter.

**Table 4.3. National Climate Change Strategies and Commitments of the Middle Eastern and Southeast Asian Countries**

Country	National strategies related to Climate change	INDC Commitment ( <i>a</i> = International Support) ( <i>b</i> = Unconditional)
Bahrain	“Bahrain National Environment Strategy, Climate Action in Bahrain and Government Action Plan 2019-2022, Bahrain’s Economic Vision 2030”	policy and development on low greenhouse gas emissions”
Brunei Darussalam	“Wawasan Brunei 2035 and National Biological Resources Policy and Strategic Plan of Action”	to reduce 63% of total energy consumption by 2035
Cambodia	“National Strategic Development Plan 2014-2018, Climate Change Strategic Plan 2014-2023, Green Growth Policy and Roadmap, National Forest Programme (2010-2029), and Reducing Emissions from Deforestation and Forest Degradation “Plus” Strategy”	27% by 2030
Cyprus	“National Adaptation Strategy and Action Plan and Integrated National Energy and Climate Plan for the period 2021-2030”	40% (EU)
Egypt	“Egypt’s National Strategy for Adaptation to Climate Change And Disaster Risk Reduction and Climate Change Risk Management programme”	aims to utilize renewable energy and nuclear power sources, requires ( <i>b</i> ) of \$73bn for adaptation
East Timor	“National Adaptation Plan, Law on Clean Development Mechanism, National Focal Point for Green Climate Fund, Environmental Strategic Plan, Decree Law on Protected Areas”	requires international support
Indonesia	“National Action Plan on Climate Change Adaptation, Environmental Protection and Management Law, National Action Plan on GHG Reduction, National Medium-Term Development Plan 2019-2024, National Energy Policy”	29% by 2030, 41% ( <i>a</i> )
Iran	“National Strategic Plan on Climate Change, Fifth 5 Year National Development Plan”	4% ( <i>b</i> ) by 2030, 12% ( <i>a</i> )
Iraq	“The National Environmental Strategy and Action Plan for Iraq”	13% ( <i>b</i> ) and 2% ( <i>a</i> )
Israel	“National Adaptation Plan”	26% below 2005 levels by 2030

Jordan	“Jordan 2025-A National Vision and Strategy, National Climate Change Policy of Jordan 2013-2020, National Strategy and Action Plan to Combat Desertification (2015-2020), National Biodiversity Strategy and Action Plan (2015-2020)”	1.5% (b) & 12.5% (a)
Lao PDR	“Forestry Strategy to the year 2020, Renewable Energy Development Strategy, Implementation of climate change action plans, National Adaptation Programme of Action (NAPA), Climate Change Action Plan of Lao PDR for 2013-2020, National Climate Change Strategy (2010), and Forestry Strategy 2020”	commits to design policies and actions to reduce carbon emissions (a)
Malaysia	“Roadmap of Emissions Intensity Reduction in Malaysia, National Policy on Climate Change, Renewable Energy Policy and Action Plan, Low Carbon Cities Framework, National Agro-food Policy, National Water Resources Policy”	35% (b) and 10% (a)
Myanmar	“30-Year National Forestry Master Plan (2001-30), Comprehensive Village Development Plan, Long Term Energy Master Plan, National Climate Change Strategy and Action Plans, National Climate Change Policy, Green Economy Strategic Framework, and National Environmental Policy, Framework and Master Plan (2030)”	presents series of sectoral goals, renewable sources and afforestation
Kuwait	“Environmental Protection Law”	moving to a low carbon equivalent economy (a)
Lebanon	“National Energy Efficiency Action Plan for 2016-2020, prepared the National Renewable Energy Action Plan 2016-2020 and National Sustainable Development Strategy”	15% (b) and 30% (a) by 2030
Oman	“Oman National Spatial Strategy (ONSS)”	2% by 2030 (b)
Palestine	Unless the country is free from Israel’s occupation, the State of Palestine is able to exercise its full control over its resources.	-not specified-
Philippines	“Philippine National REDD Plus Strategy, Philippine Biodiversity Strategy and Action Plan, Expanded National Integrated Protected Areas Systems, National Climate Change Action Plan (NCCAP), Ecological Solid Waste Management Act of 2000, Biofuels Act of 2006 and the Renewable Energy Act of 2008, National Disaster Risk Reduction and Management Law and Climate Change Act”	70% (a) by 2030
Qatar	“Qatar National Vision 2030”	economic diversification
Saudi Arabia	“Vision 2030”	renewable energy investment and economic diversification
Singapore	“National Climate Change Strategy 2012 and the Sustainable Singapore Blueprint 2015”	36% by 2030
Syria	“Green Climate Fund supports the Syrian Government to mitigate and adapt to the impacts of climate change”	-not specified-
Thailand	“Environmentally Sustainable Transport System Plan, Climate Change Master Plan (2015-2050), National Economic and Social Development Plans, Alternative Energy Development Plan (2015- 2036), National Industrial Development Master Plan (2012-2031) and Waste Management Roadmap”	20% (b), 25% (a) by 2030
Turkey	“10th National Development Plan, National Strategy on Climate Change, National Climate Change Action Plan, National Strategy on Industry & Strategy on Energy Efficiency”	21% by 2030
TRNC	-no data-	-not recognized by UN-
UAE	“Green Growth Strategy”	limit emissions & increase clean energy
Viet Nam	National Socio-Economic Development Strategy (2011-2020), Socio-Economic Development Plan (2011-2015), National Climate Change	8% (b), 25% (a) by 2030

Strategy, National Green Growth Strategy, Law on Natural Disaster Prevention and Control and Law on Environment”

Yemen “National Adaptation Plan (NAP), beneficiary of the National 1%, 14% (a) by 2030 Adaptation Programme of Action”

Source: The data shows the national climate-related action plans, strategies and policies of the aforementioned countries in their INDCs submitted to the UNFCCC. Data may change as some countries have not yet ratified that the Paris Agreement, *see*: UNFCCC, *Intended Nationally Determined Contribution*, n.d., date of access: 28 December 2019. [www4.unfccc.int/sites/submissions/indc/Submission%20Pages/submissions.aspx](http://www4.unfccc.int/sites/submissions/indc/Submission%20Pages/submissions.aspx)

Governments in the Middle East seemed to have marginal take on climate change and its impacts as reflected from their national strategies. Most countries have merely one strategy in addressing climate change effects such as those country who produce fossil fuels, the ultimate source of greenhouse gases that whips up climate change. On the one hand, Turkey, Jordan and Lebanon have crafted several initiatives related to climate change, a notable move considering the results of climate change is already stirring in the region. Palestine has indicated of exercising its full jurisdiction when the country has its full control over its resources since they are still under occupation from Israel. Yemen, Iraq and Syria have been suffering from political instability, conflicts and wars, hence, making climate-related policies not a priority as of this time.

Southeast Asian countries, unlike the latter, have adopted wide-ranging measures in terms of climate mitigation and adaptation strategies. It implies that the countries in the region are considerably impacted by climate change as well as its outcomes. The region is exposed to extreme weather conditions, i.e., severe droughts, stern flooding, the rising of sea-levels and relenting food security issues and etcetera, which all are stimulated up by climate change. These extremities can leap the increase of population movement if no apt measures are taken into reflection in the policymaking level.

Middle Eastern countries, having exposed to the impacts of climate change, are still sort of wary with their policy actions seeing the climate actions they presented are subtle perhaps because most of these countries’ economies predominantly rely on fossil fuels. In light of the compliance reiterated in their respective INDCs, most have committed to further develop and invest in renewable energy and to diversify their

economies such as Saudi Arabia, Qatar, Kuwait, Bahrain, and UAE. These states did not specify pledges on the cutback of emissions, nonetheless, Turkey commits a reduction of 21% of its GHGs discharges as indicated in their INDCs<sup>284</sup>.

Oman and Yemen, both countries with thriving economies, have pledged for an unconditional reduction of their GHGs discharge. The former conveyed 2% while the latter is 1%, although it shall increase by 14% upon international support. Iraq's case is unique, for it is targeting to lessen its emissions by 13%, unconditional and additional 2% with international support. Moreover, being an EU-member, Cyprus commits with 40% reduction deliberating the universal stance of the international union of European countries. Syria, notwithstanding the problem of socio-political and socio-economic instability incited by the half-a-decade long civil conflict, has sent its "National Determined Contribution (NDC)" in 2018; that is why it is yet to confirm its commitment to this climate initiative<sup>285</sup>.

Other countries have stated a clear stance in terms of the reduction of their GHGs production. Nevertheless, it is affirmed that it will be further increased if international support is provided. The Philippines' declaration is fairly decisive, giving the thought of conditional 70% total reduction accounting it to international support. Thailand, Vietnam, and Indonesia have pledged unconditional commitment, yet the proportion of reduction will likely expand with international support<sup>286</sup>.

Singapore is somewhat keen to lessen its carbon discharges by 36%. At the same time, Cambodia pledges with 27% by 2030, Lao PDR and East Timor profoundly reiterated their intent of demanding for international support since both generate a small number of emissions. Brunei has committed to reducing by 67% its energy consumption in support of climate change mitigation efforts<sup>287</sup>.

In the context of climate change stirred population movement, policymakers have been sluggish to recognize potential retorts to environmentally induced migration. The contemporary literature on environmentally stimulated population movements underlines that migration can have positive and negative significances, a

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<sup>284</sup> Ibid.

<sup>285</sup> Ibid.

<sup>286</sup> Ibid.

<sup>287</sup> Ibid.

consideration that affects how policies are prepared. Relating to its negative margin, predominantly from emergency mass movements that are linked to increased natural disasters and competition for resources, may end up in lower and high-concentration conflict<sup>288</sup>.

The vital function of policymakers is to discern the possible threats and chances to avoid and to prevent tragic occasions to befall in the succeeding years in the context of climate change impacts. The shaping of effective and well-implemented climate policies is advantageous in both financial and physical particulars, for it promotes mitigation and adaptation actions to thwart the effects of the latter.

National and local strategies remain a crucial solution in the reduction of disaster risk rate and population distribution. With apt adaptation and mitigation measures, the rate of vulnerability can be reduced. However, a single country cannot work alone in dealing with climate management as it is a global predicament that demands cooperation, such as on strategies on global decarbonization, increasing afforestation, waste management, and climate management initiatives.

Any environmental and climate policy inquests into the inherent impacts and conclusions of climate change and other natural disasters, hence, the institutionalization of mitigation and adaptation strategies to various extent to curb its effects to coastal regions, physical structures, economy, agriculture, and the ecosystems. At a greater distance, it discusses the operational means in assessing and scheming the interests of the general public.

All the above mentioned national policies, strategies, and visions, even without full context re-counted on migration, have an indirect impact on population movement provided it is primarily realized and further improved to impede climate change, which drives migration. Migration, on a reflective annotation, is a strategy afforded to a person or population to flee from the source of insecurity from their former dwelling like copious environmental agitations. Hence, when climate impacts are suppressed because of the effective implementation of environmental or climate policies, it will retort the dilemma of population movement under the umbrella of climate change.

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<sup>288</sup> Susan Martin, *ibid*, p. 357.

### **4.3. Disaster Management Strategies in the Middle East and Southeast Asia**

There is an intricate relatedness between climate change and disaster risk reduction. More drastic weather conditions in the proceeding years, within the bounds of possibility, are to increase the number and scale of disasters. In contrast, existing strategies and mechanisms for disaster risk reduction layout a high capacity for adaptation to climate change. The Secretariat of “United Nations International Strategy for Disaster Reduction (UNISDR)” indicates the inherent characteristics and gravity of climate change in the prospect of disaster, on top of the crucial frame of illustration and line of actions for disaster risk reduction and how comprehensive adaptation strategies can be reinforced. It is intended for academics, non-specialists, involving professionals, such as scientists, scholars and the like<sup>289</sup>.

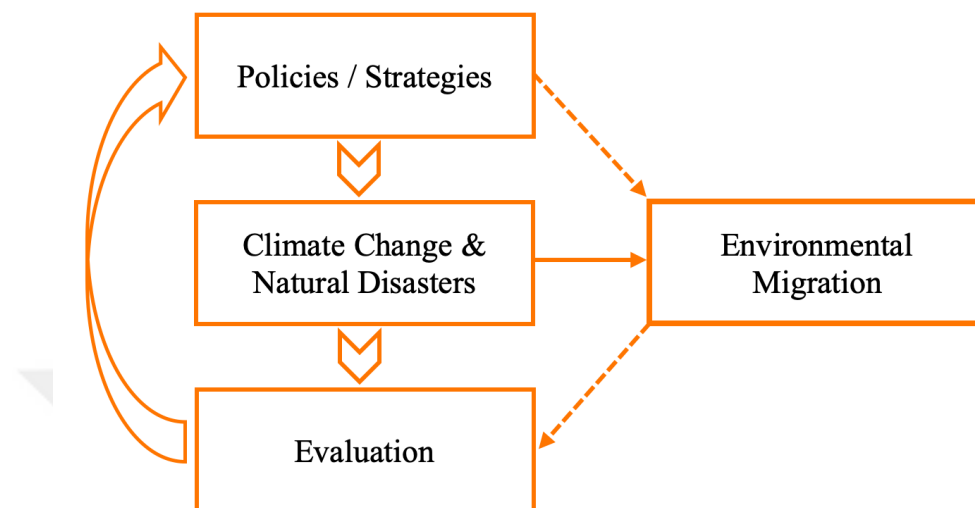
Disaster management aims to reduce and to minimize risks. It similarly allows us to explicate the roadmap of both national and local resources to tackle the extents of its threats. At the same time, it paves the way to see to it that no disruption will occur upsetting the economy and any other physical features that would disenable the activity of a local community or the state in a broader perspective. One of the critical elements of disaster management is ensuring adequate assistance for victims of calamities by natural disasters and fortify immediate and systematic rehabilitation procedures.

In the light of migration according to experts, changing climate patterns can incite severe natural disasters such as earthquakes, tsunamis, volcanic eruptions, extreme precipitation discharges resulting to floods and increasing in temperature that may lead to droughts that can impact agroindustry, the economy, local environments and people’s livelihood; hence, the inception of the nexus of population movement.

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<sup>289</sup> UNISDR. *Climate Change and Disaster Risk Reduction*. Briefing Note. Geneva: UNISDR, 2008. 1.

**Figure 4.1. Indirect correlation of Disaster Policies and Strategies to Environmental Migration**



A course of actions on disaster through mitigation and adaptation policies and strategies is a methodical system for both environmental and human security principles. It intends to implement a binding procedure and establish a traditional practice in prevention, reduction and proper response in times of natural calamities. Policies and strategies inclined with environmental principles are earmarked to get to the bottom of the problem, which is climate change and extreme natural calamities. The substantiality of a policy, an environmental law per se, is to promote environmental management where the philosophies of protection and conservation are attached to. The same goes to climate strategies and policies which are premeditated to set a margin or curb the effects of climate change by limiting carbon discharges.

At first-hand, most countries, especially in Southeast Asia and the Middle East, are yet to establish policies on environmental migration. Though this situation is an apparent problem, policies and strategies fostering a direct account on environmental migration appeared to have not looked appealing, at this time and date, to most policymakers. However, policies and strategies sponsoring climate change mitigation and adaptation actions as well as other environmental policies, on a positive note, can eventually create an indirect impact on the prevention and management of

environmental migration. The secondary effect of these policies may seem unintentional. However, recent evaluations can provide an input interpreting the gravity of human population movements and sudden displacements drawn by natural disasters and climate change.

Assessments on the impacts can outline the significance of having comprehensive policies and strategies in managing natural disasters and climate change. Extensive assessments on migration elicited by environmental changes may opt concerned government institutions and policymakers to formulate a local, sub-national and national plans on disaster and climate change elicited population movement. It can pave the way to either strengthen environmental and climate policies or enact policies that will directly cater to the prerequisites of environmental migration.

#### **4.3.1. Disaster Management in Southeast Asia**

Established in 1967, the “Association of Southeast Asian Nations or ASEAN,” a regional political organization in Southeast Asia, has developed a disaster response “One ASEAN, One Response” vision in 2015 to create a collaborative action in disaster reduction management<sup>290</sup>. The declaration objectifies to foster immediate response, to organize broad support system and to set forth a more comprehensive disaster management coordination among the 10 member-states. It centres on the imperative contribution of collective responses founded on the strengths and capacities of various sectors and other stakeholders of ASEAN Community.

In 2009, “ASEAN Agreement on Disaster Management and Emergency Response (AADMER)” presented into force but was actually indorsed in 2005 by 10 member-states<sup>291</sup>. This regional pact conjures up an image of disaster resiliency of nations in the region. Joint response on disaster emergencies is one of the highlights of this agreement, besides, there is a disaster fund enclosed with this arrangement that intends to support the communities endured calamities.

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<sup>290</sup> AHA Centre, “ASEAN Joint Disaster Response Plan (AJDRP),” 2017, date of access: 19 January 2020, [www.ahacentre.org/files/AJDRP.pdf](http://www.ahacentre.org/files/AJDRP.pdf)

<sup>291</sup> Ibid.

**Table 4.4. Disaster Risk and National Frameworks of ASEAN Countries<sup>292</sup>**

Country	Disaster Risks	National Institutional Frameworks	Numbers of Recorded Disasters (2018)
Brunei Darussalam	volcanic eruptions, typhoons and earthquakes,	“National Disaster Management Centre (NDMC)” under “Disaster Management Order (DMO)”	4
Cambodia	floods, drought, typhoons, heavy storms, fire incidents and epidemics	Law on “Disaster Management” formalizing the “National Committee for Disaster Management (NCDM),” Sub-national committees down to local level	14
Indonesia	tsunamis, earthquakes, volcanic eruptions, droughts and flooding	“National Disaster Management Agency (BNPB)” supported by the “Disaster Management Law (DM Law)”	998
Lao PDR	flash floods, flooding, monsoons, severe storms, and landslides	“National Disaster Prevention and Control Committee (NDPCC)”	16
Malaysia	floods, seismic activity, tsunami, cyclonic storms, landslides, epidemics, forest fires, and haze	“National Disaster Management Agency (NADMA)” and “Community Based Risk Reduction (CBDRR)”	88
Myanmar	flooding, landslides, cyclones, destructive earthquakes, and periodic droughts	“National Disaster Management Agency”	70
Philippines	volcano eruptions, typhoons, landslides, droughts, floods, earthquakes and tsunamis	“National Disaster Risk Reduction and Management Council (NDRRMC)” supported by the enactment of the “Philippine National Disaster Risk Reduction and Management Act of 2010”	163
Singapore	The area where the country is situated is one of the most disaster prone regions in the world.	“Disaster risk management is under a Government Integrated Risk Management policy framework” aside from the “Civil Defence Act” updated in 2011	4
Thailand	flooding, typhoons, droughts, landslides, earthquakes and tsunamis	“National Disaster Prevention and Mitigation Committee (NDPMC)” based from “Disaster Prevention and Mitigation Act of 2007 (DPM)”	112
Viet Nam	landslides, floods, typhoons, and tsunamis	“Central Committee for Natural Disaster Prevention and Control (CCNDPC)” and “Vietnam National Disaster Management Authority (VNDMA)” supported by the “Law on Natural Disaster Prevention and Control 2013”	117

Source: CFE-DM, *ibid*, pp. 35–40

<sup>292</sup> National Institutional Frameworks working on disaster management in every country are mandated to formulate policies and strategies in managing the impacts and risks of disasters in its jurisdiction. It sets out a guiding principles and processes that outlines all actions to be taken to reduce the risk of avoidable disaster and minimize the loss should a disaster befall. As for its link to environmental migration, policies and governmental responses play a share in determining the vulnerability of communities and so to the tendencies of displacements. Disaster management can shape the outcomes of natural catastrophes by enabling mitigation and adaptation policies in preventing the latter’s consequences.

Given the quantified disaster risks and the geographical setting, it is without a reservation Southeast Asia is one of the most susceptible regions in the world from natural calamities and the blows of climate change. Natural disasters such as typhoons, floods, landslides and heavy storms are anticipated to be significantly elicited by the altering of climate settings making its outcome more severe resulting to high numbers of casualties, economic loss and damage to infrastructures. Nonetheless, in grips of environmental problems, resource allocations and standard of living, it shows prodigious differences in developed and industrialized countries and poor countries seemed to be heading backward<sup>293</sup> just like the paradigm of Singapore among other its neighbouring countries in the region.

With its colossal territory and the reality of various natural calamity, Indonesia led the record of having the most number of disasters with nearly a thousand, followed by the Philippines and Viet Nam based on the ASEAN Disaster statistics in 2018. On a significant find, there were about 1,586 total recorded disasters in the region. It presents an abstract of forging a socio-political setting that urges authorities to take part in a dynamic function to fronting these setbacks by building action plans to reduce and to minimize the impacts<sup>294</sup>.

The course of events on environmental displacement is apparent in southeast Asia, citing the topographical position of the region with typhoons in the east, cyclones in the west, the verity of volcanic discharges and the bearing of the Pacific rim underneath making it conclusively disturbed by remarkable types of natural disasters. The experiences of the Philippines and Indonesia alone where there are immense figures of environmentally displaced (see page 47 and 52) would justify why the region is vulnerable to natural disasters and relatively inclined to the impressions of climate change.

Singapore, Malaysia and Brunei have the most robust economy among its neighbours, hence the preparedness in times of natural calamities. Developing countries mostly have the most number of displacements and economic loss since they are more exposed to the high risks of disasters. Besides, these countries are not

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<sup>293</sup> Ruşen Keleş, "Kentleşme Politikası," *İmge Kitabevi*, Ankara, 2016, p. 612.

<sup>294</sup> CFE-DM, *ibid*, pp. 35–40.

equipped with the necessary technologies to fast track disasters to manage and anyhow to prepare before it befalls. People live at high risks areas, weak housing structures and poverty as well are one factor to consider why developing countries are suffering right after every massive disaster occurred, such as the paradigms of the Philippines, Myanmar, Laos, Cambodia, Indonesia and Viet Nam.

The ultimate key to building an all-inclusive resiliency is to shaping a proactive disaster preparedness strategies, structuring an active correspondence in policies of the governments from local, national and international levels incorporating the contribution of civil society organizations, universities, scholars and individuals. As manifested in the intents of ASEAN in their preceding regional meetings, it goes to display a motive of engaging to a comprehensive approach of a process of formulating policies and strategies to come up with operational solutions in gearing with disaster-related emergencies.

The paramount implication of regional cooperation not just in the perspective of ASEAN being a regional organization but also with other international entities is that it dispense a decisive support system in terms of information-sharing and potential capacity-development upgrades concerning disaster risks profiles that concerns countries involved.

#### **4.3.2. Disaster Management in the Middle East**

The region for a reason is apportioned with nationals with Arab heritage and other nationals, i.e., Turkey, Iran, Israel, and Cyprus, with distinct cultures and norms. The Middles East somewhat has no formal regional organization except the League of Arab States comprised of 22 countries such as Bahrain, Kuwait, Oman, Saudi Arabia, Palestine, Lebanon, Jordan, Egypt, Syria, UAE, Iraq, Yemen and Qatar, and other Arab countries in North Africa.

Regional cooperation is considerably complicated, and a multifaceted topic encompassing the case of the Middle East since each of these countries are confronting internal and external disputes, not to mention the struggle of some from civil conflicts and other socio-political and economic instability. The very idea of cooperation in terms of disaster management is likely to be disentangled by states' respective

governments most, especially those that do not belong to the Arab League. However, a bilateral and multilateral agreement between states can be an option to address regional disaster management that serves their interest best.

From the last 30 years, floods have been the most common natural calamity in the record as per the data documented by “Emergency Events Database (EM-DAT)” with estimated 300 events or 53% of the overall number of natural calamities. Earthquake, further, is accounted for 24%, while storm and drought incidents are both reported with 10%. However, the stunted rate of droughts is because of the inadequate obtainability of data<sup>295</sup>. A manifestation that the region, to a certain degree, is not only limited to human-made adversities like wars and civil conflicts but also several natural disasters.

States across the Middle East are progressively attempting to look for a proactive means in DRM. Besides, a greater awareness of the complexities of DRM has culminated in progressive policy changes when a variety of specific DRM organizations are set up, and developments in national services are built. Such services incorporate early warning systems and risk assessments at national and local levels. The Islamic Conference of Environment Ministers introduced the “Islamic Strategy for Disaster Risk Reduction and Management (ISDRRM)” in 2010, which seeks to develop robust DRM frameworks and policies throughout Islamic countries<sup>296</sup>.

In contrast, the Secretariat of UNISDR claimed that in 2011, several countries in the region have not succeeded in making disaster and preparedness management a priority recounted in their respective national database that will distinguish the severity of the risks to improve and to develop necessary proactive responses. As for a regional strategy, Luna Abu-Swaireh, the regional programme officer of UNISDR expounded that “for the first time this region has a strategy for 2011-2020 that outlines a commitment to reducing risk and vulnerability for the Arab countries and populations

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<sup>295</sup> The World Bank. “Natural Disasters in the Middle East and North Africa: A Regional Overview.” Washington DC: World Bank, 2014, p. 2.

<sup>296</sup> The World Bank, *ibid*, p. 2.

by working on multi-hazard approaches, risk assessment, identification and enhancing capacity<sup>297</sup>.”

However, this pronouncement only applies to the countries of the Arab League. Countries that are not members of the latter like Turkey, TRNC, Iran, Cyprus, and Israel, just like any other sovereign state, formulate their national strategies, frameworks, and policies to augment the essentiality of having a comprehensive DRM to reduce the impacts of natural disasters.

Moreover, distinguished in Table 4.5., earthquakes, flooding, and extreme temperatures are seen likely to occur in most countries in the region. Earthquake is an unpredicted natural disaster that can happen anywhere anytime with no forewarnings. The substance of having a comprehensive DRM lies from the disaster frameworks embedded in every institution designed to manage risk reduction.

**Table 4.5. Disaster Risks and National Institutional Framework in Middle Eastern Countries**

Country	Disaster Risks	National Institutional Framework
Bahrain	droughts, extreme temperature	“National Committee for Disaster Management”
Cyprus	droughts, earthquake, extreme temperature, storms, wildfires	“Cyprus Civil Defence”
Egypt	floods, extreme temperatures, storms, droughts, earthquake	“National Committee for Crisis Management and Disaster Risk Reduction”
Iran	earthquakes, floods, droughts, landslides, storms	“National Disaster Management Organization”
Iraq	earthquakes, floods, droughts	“Directorate General of Civil Defence”
Israel	droughts, extreme temperature, storms, wildfires	“Steering Committee for Disaster Reduction”
Jordan	earthquakes, flash floods, floods, landslides, storms, extreme temperatures	“High Council of Civil Defence”
Kuwait	floods, earthquakes, extreme temperatures	“Civil Defence”
Lebanon	flash floods, floods, landslides, storms, extreme temperatures, forest fire	“National Coordination Committee on Disaster Risk Reduction”
Oman	droughts, extreme temperature, storms, storm surges, earthquake	“National Committee for Civil Defence”
Palestine	floods, landslides, storms, extreme temperatures	“General Directorate of Civil Defence”
Qatar	earthquakes, extreme temperatures	“The Permanent Committee of Emergency”

<sup>297</sup> Reliefweb. “Middle East: Ramping up disaster preparedness.” 26 May 2011. The New Humanitarian. 15 January 2020. [www.reliefweb.int/report/egypt/middle-east-ramping-disaster-preparedness](http://www.reliefweb.int/report/egypt/middle-east-ramping-disaster-preparedness)

Saudi Arabia	earthquakes, floods, high temperatures	“Civil Defence”
Syria	heat waves, floods, landslides, storms, droughts, extreme temperatures, frosts, windstorms	“Civil Defence Department”
Turkey	earthquakes, floods, droughts, landslides, storms, wildfires	“Disaster and Emergency Management Presidency of Turkey (AFAD)”
TRNC	-no data-	-no data-
UAE	earthquake, extreme temperatures	“National Emergency Crisis & Disasters Management Authority”
Yemen	flash floods, floods, storms, earthquakes, extreme temperatures, landslide, thunderstorms	“Ministry of Water and Environment”

Source: the information provided in this table are based on the country profiles and other related data on DRM available in UNDRR<sup>298</sup>, UNOCHA<sup>299</sup> and UNDP’s<sup>300</sup> websites.

Contemplating with the region’s past disaster experiences over the preceding decades, the Middle East has suffered to a great extent from massive natural calamities. Such as the earthquake that claimed thousands of lives and concluded to thousands of recorded injuries specifically in Turkey, Yemen, Iran, and Egypt (*see page 65 for detailed information*). Flash floods, extreme weathers, the severity of temperatures, and droughts driven by the changing climate pose a substantial impact on farmlands and to the local economy. In the long run, it constructs a serious bearing to the national interest.

The incidences of migration in Syria is not only caused by socio-political instability but also incited by environmental factors (*see page 81*) because lands were too dry to sustain crops and to feed livestock. Hence, the justification of population movement from rural to urban areas to seek opportunities considering their local environment can no longer support the population’s fundamental needs. This practical migratory approach somehow is a hybrid mobility response of a person or a group of people taking into account that it is a mixed result of economic and environmental fallouts.

The birth of DRM in the region is new deriving from the statements of UNISDR connoting the gravity of disasters seen uncommon in the Middle East at this time and date. Perhaps climate change gave rise to the intent of several countries in the region

<sup>298</sup> see: [www.preventionweb.net/](http://www.preventionweb.net/), a platform managed by UNDRR.

<sup>299</sup> see: [www.reliefweb.int/](http://www.reliefweb.int/), a service provided by UNOCHA.

<sup>300</sup> see: [www.undp.org](http://www.undp.org), the official website of UNDP.

to form models, strategies, and policies to strengthen their DRM and to pull off a proactive response in times of natural calamities. Should the region establish a regional pact declaring a multilateral DRM response, it can lead to better disaster response in terms of cooperation and coordination since most share the same enormity of risks. It may eventually retort to schemes of addressing unrelenting human-made disasters.

The preceding involvements of the Middle East in disasters were not entirely elicited by natural calamities instead drawn out by human-made adversities, i.e., terrorism, civil wars, etcetera. It led the region, especially in countries with problems in terms of socio-political instability, disregard the other realities awaiting them, the climate change. On the other hand, the chaotic veracities that materialized in Iraq, Syria, and other parts of the region opted governments to respond in a practical manner, which is to engage in a political confrontation that concluded to warfare that even today still surfaces.

Based on facts, majority of countries in the region do not make DRM as of primacy in government matters. However, Turkey sets as an example of efficaciously practicing the principles of DRM for it already has experienced several times natural calamities and has addressed the problems effectively. Other countries such as Iraq, Syria, Yemen, and Iran do not seem to make the issue of DRM as a national priority as of the time being because they, too, are struggling to address some of their issues, i.e., war-conflicts, terrorism, socio-political and economic problems and security across their borders.

#### **4.4. Evidence of Environmental Displacements across the Middle East and Southeast Asia**

Visualizing the evident migration events in the Middle East and Southeast Asia, environmentally-induced displacement is superficial to materialize and is likely to occur inevitably. IOM argued that “environmentally displaced people (EDP)<sup>301</sup>”

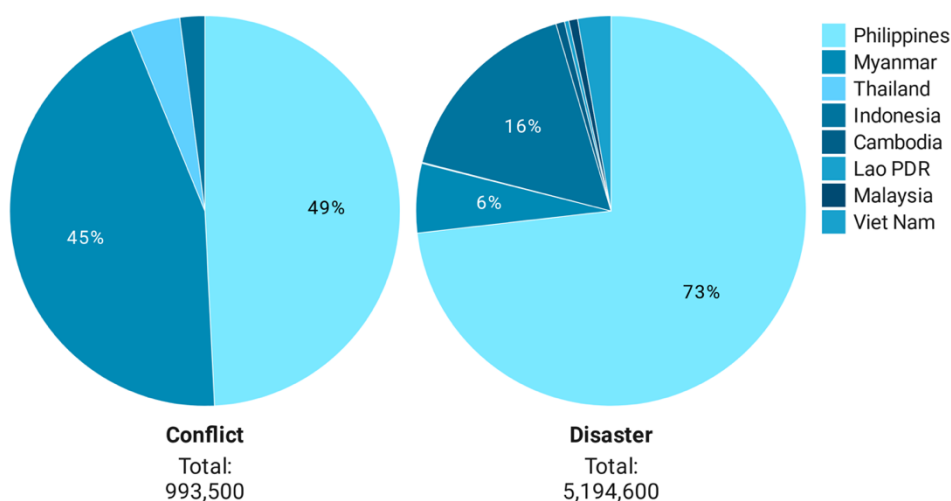
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<sup>301</sup> EDP as terminology is resorted to as a less contentious substitute to environmental refugee or climate refugee. In the context of displacements across international territories considering the person or group of people have no legal basis or imperative purpose of moving according to international law in reference to the arrangement of environmental migrants whose intention is forced in nature. *see*: IOM, *ibid*, p. 13; IOM, *ibid*, p. 30.

pertains to those who are compelled to abandon their place of origin in view of the fact that there is insecurity in their local environment due to environmental degradation, natural calamities that may cause displacement<sup>302</sup>. On top of that, this process all boils down to the umbrella of migration. The variations in the environment serve as a causative element for a person or population in deciding to migrate.

In 2018, IDMC reported that 61% or 17.2 million of new documented displacements are incited by natural disasters and the remaining 39% or 10.8 million were prompted by conflicts. There were roughly 1,600 natural calamities that incited new figures of displacements globally and most were accounted for weather-related risks, i.e., storms, cyclones and typhoons. Geophysical-related incidents like earthquakes, volcanic eruptions and tsunamis resulted in 11 million numbers of latest displaced people. The statistics provided by affirms that the Philippines, China and India are recorded to have produced the 60% of the total natural disaster-related displacements<sup>303</sup>.

**Figure 4.2. Internal Displacement in Southeast Asia 2019**



Source: IDMC, *Global Report on Internal Displacement*, IDMC, pp. 118-120.

<sup>302</sup> IOM, *ibid*, p. 13.

<sup>303</sup> IDMC, *ibid*, pp. 6–7.

Southeast Asia, in reference to Figure 4.2., has nearly a million displaced people due to conflicts and more than 5 million displacements elicited by natural disasters. The Philippines holds the most numbers of new displacements in the world having 4.2 million combined population movements incited by conflicts and disaster-related problems tagging along with China, Ethiopia, India and the Democratic Republic of Congo<sup>304</sup>.

The Philippines also holds the 49% (489,000) of new cases of displacements due to conflicts in SEA. It accounts for 73% (3.8 million) of the total latest displacements as a conclusion of the aftermaths of natural catastrophes in the region. Indonesia renders a record of 2% (20,500) driven by conflicts and 16% (853,000) out of disasters. Myanmar has 45% (443,000) caused by conflicts and 6% (298,000) triggered by disasters. Thailand, in the same aspect, has about 4.1% (41,000) figures of displacements from conflicts and 0.1% or 4,600 from disasters; Cambodia has 0.7% (37,000) displaced from disasters while Lao PDR has 0.40% or 19,000, Malaysia has 0.7% or 38,000, Viet Nam holds 3% or 143,000 number of displacements induced by natural disasters. Brunei and Singapore, on a serious note, have no records of displacements out of conflicts and disasters<sup>305</sup>.

The statistics, itemized in Figure 4.3., affirms that the Middle East carries the most records of displacements with more than 14 million conflict-related and about 2 million from extreme droughts, intense raining and flooding. Syria still holds the most number of displacements then and now. The country, on the issue of conflict and violence, then had a record of approximately 6,119,000 but recent statistics confirm that about 1,649,000 new displacements were added. Hence, 55% of the total displacements are accounted for with the latter. Further, the country is also reported to have acquired 13% (27,000) of the displaced people due to natural catastrophes in the region making it hold the highest record of displacements in the world all because of the relentless political conflicts<sup>306</sup>.

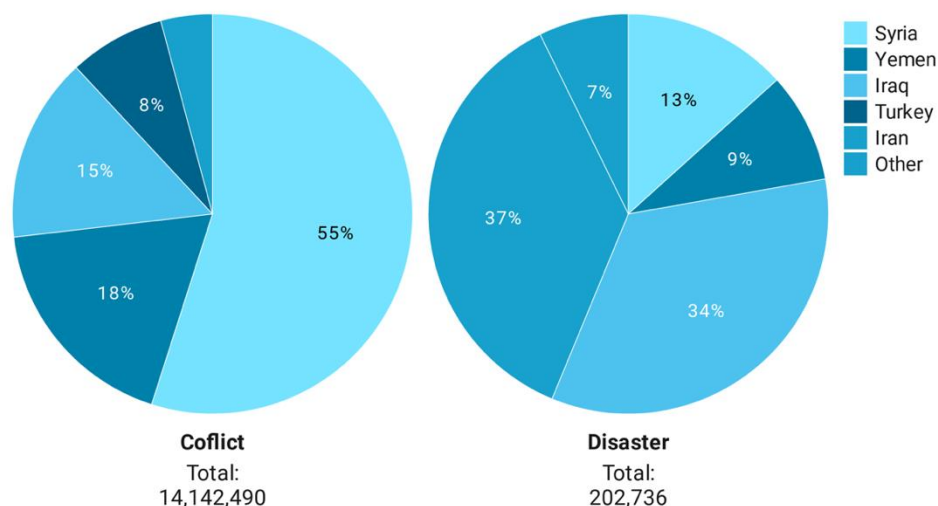
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<sup>304</sup> Ibid, pp. 118–120.

<sup>305</sup> Ibid, pp. 118–120.

<sup>306</sup> Ibid, pp. 118–120.

**Figure 4.3. Internal Displacement in the Middle East 2019**



Source: IDMC, *ibid*, pp. 118-120.

Yemen, on the other hand, has 18% (2,576,000) of the region's record of displacements because of conflicts and at least 9% (18,000) triggered by disasters. In the same sequence of events, Iraq has 15% (2,112,000) conflict-related displacements and about 34% (69,000) of the region displaced people driven by calamities were in the country. Turkey is hosting 8% (1,097,000) the latest IDPs from its neighbours and the country has about 0.3% (640) recorded displacements due to disasters. Egypt relatively has 0.8% (112,000) of displacements because of conflict, and the State of Palestine in reference with its political struggle has mounted to at least 1.7% (238,000) and Lebanon has 0.1% (11,000) of displacements driven by conflicts<sup>307</sup>.

With the reality of environmental displacement, Jordan has 1% (2,000) data of displacements the same statistics with Saudi Arabia has. Iran has no reported data of conflict-induced displacements but has at least 37% of the region's latest displacements due to natural calamities while Oman has at least 4.9% (10,000).

<sup>307</sup> *Ibid*, pp. 118–120.

Nonetheless, small states such as Kuwait, Bahrain, Qatar and UAE has no reported cases of displacements in both drivers of human population movements. Israel has 80 reported displaced people because of disasters<sup>308</sup>.

Cyprus, IDCM argues that 228,000 people or 1.6% of the total displacement in the region are the people who remain displaced as a result of the deadlock between the Turkish and the government of Greek Cypriot over the political standing of the north of the island<sup>309</sup>.

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<sup>308</sup> Ibid, pp. 118–120.

<sup>309</sup> Ibid, p. 46.

## **Evaluation and Conclusion**

The environment changes over time, and it is scientifically definite. The alteration in the environment can always construct tremendous impacts on humankind, be it large or small. Southeast Asia and the Middle East in this study, being one of the most susceptible to the happenstance of environmentally-incited human population movement, the two regions remain irresolute in managing the emergence of the latter. On a side note, mitigation and adaptation only are determined by states, be it in local, national, and international levels, when it faces immense changes in the environment. Thereby forms opportunities to lessen, to prevent and to reduce its impact, the earlier the creation of policies and strategies the better. A cliché it may seem, but prevention is quite better than cure such as the progression of migration because of environmental upheavals in the face of severe disasters.

Past events can strongly reveal how all environmental problems, even in its simplest systems, distress human undertakings. Nevertheless, a similar thing happens to the ecosystem reflecting the humankind's dire misuse and overuse of natural resources, a quite correlative arrangement between the two resulting to destruction of both. Migration comes in as a natural strategy of humankind in response to threat, insecurity and opportunities set by various dealings such as environmental insecurity, natural disasters, food and water insecurity.

Human population movement can realistically be stimulated by consequential environmental alarms relating to the ecological imbalance because of the proliferating deterioration of the environment, the abuse of natural capitals which is indispensable for industrialization, intense natural adversities, and of course, climate change is a surfacing global environmental agitation that can trigger the magnitudes of environmental migratory incidence.

At this date and time, the nexus between the environment changes, climate change and population movement have progressively been a crucial cognizant agenda in the process of systematizing policies and strategies at the local, national and international levels in the recent years. It incorporates predicaments linked to climate change and migration incited by environmental changes. Besides, taking a closer look at environmental migration as a societal reaction from the risks of climate change and

extreme natural disasters, it may underscore comprehensive arrangements of multi-tiered mitigation and adaptive capacities. It should predominantly be extracted from the grassroots levels considering they are the front liners in times of natural disasters and must be reinforced by the national benchmarks, and international institutions must lend support.

Population movement, in all kinds, is conceivably the evident adaptive mechanism to climate change, taking into reflection all its facets that without any deviation affects the human population. The continuance of climate change is predetermined but slowing it down is indeed possible through a comprehensive, collaborative force from all. As climate change continues to alter local living conditions, the population in environmentally-unstable and vulnerable regions with exacerbating conditions may reach to a conclusion to relocate to better places avoiding some foreseeable natural disasters. Even so because of the unavailability of options, the life-threatening out-turns of climate change happen with no warning, which may force dwellers to leave their home and move to relatively better and safe places.

On a broader interpretation, the impacts of climate change above anything else have explicit bearings to societal systems which also trigger population movement. *(a) Economic*, augmenting natural disasters stir up capital losses such as in the industries of forestry, agriculture and aquaculture, severe droughts and intermittent precipitation discharges can impair agricultural production. *(b) Social*, environmental havocs set off various impacts on human population distressing human activities and livelihood. Moreover, *(c) Political*, climate change variabilities then demands governments to enforce mitigation and adaptation policies to minimize and to reduce the tangible impressions of the latter and other destructive natural adversities.

Reports confirm that Southeast Asia is highly exposed to disasters according to the inferred statistics delivered in this study. The reality of environmental migration is preordained stating the illustration that most countries in the region are exposed to extreme climate conditions such as strong typhoons, massive floods, tremendous amount of precipitation discharges, sea-level rise, increasing temperatures and lengthy droughts excluding the veracity and frequency of earthquakes and tsunamis manifesting the geographical site of Southeast Asia.

Southeast Asia had the most numbers of displacement instigated by natural calamities. Most of which is accounted to the Philippines, which has the most figures of internal displacement in the world. Indonesia ranks second, then Myanmar, followed by Malaysia, Vietnam, Lao PDR, Thailand and Cambodia. In contrast, Brunei and Singapore proportionately have no records of disaster-related displacements. Additionally, the realization of developmental and environmental triggered migration in the given circumstance of the Mekong River is something that would intimidate millions of dwellers in local communities across the river banks in Myanmar, Thailand, Laos, Cambodia and Vietnam due to the developing of colossal Chinese funded dams.

Sea-level rise, similarly, can be a surfacing threat to coastline and island communities throughout the region in the light of the categories of natural disasters and topographies of Southeast Asia. The island state of Singapore, archipelagos of the Philippines and Indonesia and other coastline countries like Malaysia, Thailand, Vietnam, Cambodia, Myanmar and Brunei are at risk of coastal flooding that is seen to distress coastline cities and local communities. Experts contend that the capital cities of Manila, Jakarta and Bangkok are the top three cities of high risk in terms of environmental displacement because of the rising sea-levels. The government of Indonesia has openly affirmed its interest in building a new capital on the island of Borneo because its capital is relatively descending.

Southeast Asia is mostly comprised of developing countries that are the most thwarted by the aftermaths of climate change and deliberated to be the least capable of responding to its impacts. The extent of their vulnerability is significant because of multi-layered elements curbing their capacity in mitigating and preventing the culmination of climate change such as food insecurity, environmental migration, economic impairment and the like. The actuality of climate change shapes a potential reversal factor to imperative development expansions in these countries. More climate impacts would translate to more rehabilitation and rebuilding efforts to the loss and damages.

As for the outlook towards the Middle East, migration patterns are most often dictated by crises that have something to do with humanitarian incidents such as wars and civil conflicts. It triggered hundreds of thousands of internally displaced people

and compulsory migrations of refugees from Syria, Iraq and in other parts of the region, apart from the frequent terrorist attacks by certain extremist groups. With variabilities in the Middle East, the nature of forced migration triggered by socio-political conflicts appears to be an essential factor in the trends of population movement.

There is a serious concern that the migration crisis in the region might intensify because of environmental changes even though conflict-related displacements or socio-politically-induced migration is at its high peak in the record. Unlike Southeast Asia, the region is accounted for a relatively small proportion of displaced people driven by natural catastrophes. Iran has the most number of displacement, followed Iraq, Syria, and Yemen. Several Middle Eastern countries such as Turkey, Israel, Egypt, Saudi Arabia, Jordan and Cyprus, compared to the latter, only has a small ratio of displacements. Small Arab states, somewhat, have no documented cases of displacement in both areas of migration.

There are direct and indirect economic implications of climate change in the Middle East relevant to rich countries down to the poor ones. Extreme weather situations can impact the productive capacities of a workforce, drastic floods and prolonged droughts may upset agricultural, and livestock yields, and the substantiality of sea-level rise may induce relocation to areas low lying areas in the Mediterranean coasts, Arabian gulf and red sea. Economic activities considerably rely on the efficiency of the workforce comprising the magnitude of production, and with the impressions of climate change, this could be severely agitated.

Insecurity in both water and food resources may motivate population movements. Understandably, some migration in the Middle East is activated by the inability of a local environment to support its population as per their fundamental needs is concerned, as the case of Syria long before the civil conflict started. Somewhat, it is the reactive approach or a concluding alternative to survive from hunger and scarcity, a socio-environmental situation deemed stretching to a person's safety, security and livelihood. Besides, environmental insecurity may prompt conflict over natural resources in retort to lack of resources, extreme poverty and calamities, and climate change is a complementary cause to the latter.

Moreover, it is mentioned that it is a difficult task to bring the issue of climate change in the political table. Thus, it is formidable to influence politicians from across the regions of Southeast Asia and the Middle East to formulate proactive policies in mitigating and adapting with the impacts of climate change. Southeast Asia has concluded to build a regional consensus forging a depiction of disaster resiliency of the ASEAN countries. To some extent, it portrays a joint response on disaster crises as one of its significant highpoints of the agreement on DRM, not to mention the availability of a disaster fund that aims to aid communities endured by calamities that instigate environmental displacements. Perhaps driven by political instability, regional cooperation in the Middle East is considered a complex political pursuit. It, therefore, steered each country in the region to draw up its climate and disaster-related policies because a regional collaboration is indeed impossible.

From a policy-related standpoint, it is vital for the countries in both regions to set forth comprehensive socio-political and environmental policy frameworks to design appropriate mitigation and adaptation strategies since climate change itself is from a multifaceted source. Southeast Asian governments have implemented a wide array of policies when it comes to climate mitigation and adaptation efforts. Some Southeast Asian countries have committed to reducing their GHG discharges as indicated to their INDC. However, at some point, some expressed their willingness to cut their emissions by a substantial volume upon international aid. Middle Eastern states, however, whose economies principally depend on petroleum products, one of the fundamental causes of global warming, have pledged to further develop and invest in renewable energy and to diversify their economies. Other countries like Turkey, Oman, and Jordan have committed to reducing their emissions.

Also, the majority of the countries in both regions are signatories and have ratified the Paris Climate Agreement. The international pact's primary aim is to decarbonize this era by limiting and lessening carbon productions to comply with the 1.5°C earmark above the pre-industrial 2°C planet's temperature. Yes, for some, this is too unrealistic to realize seeing that most countries have enormous reliance on fossil fuels, an essential requirement for developing economies. It somewhat a quite rigid situation for many countries but may end to practical advantages in terms of environmental security and the falling of the fallouts of climate change. Thus, this pact

is driven by the reality of climate change initiated by a large-scale confederation to deter the forthcoming extreme events fuelled by climate change. The only source of difficulty is that the deal itself has no ample sanction is made available for the Parties who will fall short in fulfilling its objectives. However, to implement sanction, as most scholars would argue, is not a panacea.

Most countries, especially in Southeast Asia and the Middle East, are yet to determine strategies and policies accounting to environmental migration. Though this situation is an ostensible socio-political and environmental issue, policies and strategies adopting a direct response on environmental migration appeared to be not appealing, at this time and date, to most legislators. However, policies and strategies backing environmental strategies and policies as well as climate change mitigation and adaptation actions, on a constructive note, can eventually design an indirect effect on the prevention and management of environmental migration. The secondary effect of these policies may seem unintentional; however, evaluations can postulate an input interpreting the gravity of human population movements and sudden displacements drawn by natural disasters and climate change.

On the one hand, climate change-incited migration currently recognized as 'climate refugees' conjectures the demand for interference in political dialogue at the international level, among all stakeholders and governments to enterprise policy propositions that should identify climate refugees or environmental migrants the same way as political refugees. These two, from an academic perspective, are omitted in the pronouncement of the 'Refugee Convention.'

Time is categorically changing. Climate change and its impacts are the reality today which activate forced migration, whether within the country of habitation or across borders. Hence, the two categories of population movement should also be recognized in the declaration indicating that a population's local environment is unsafe due to severe natural disasters and other environmental problems that are perceived risky to human life.

Climate change is not meant to be undertaken solely by a single state. Instead, it is a universal issue that requires extensive efforts at the global stage. As for its relevance to migration, any extensive policies and strategies deliberately arranged to thwart the effects of climate change have an indirect influence on environmental

migration long as it is deemed intensive in the implementation process. It is a fact that successful planning and intervention systems can preclude potential damages and loss from environmental disasters.



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