
10. Human security and climate change in the Mediterranean region

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1. INTRODUCTION

This chapter investigates human security and its intersections with climate change in the Mediterranean Region (MR). It does so by measuring human security at national level, and by critically discussing an ethical approach for improving human security in the MR. Adopting a regional perspective is particularly useful to account for the traits of human security, in that it favours the recognition of its interregional dynamics, its environmental, cultural and governance dimensions, and its multifaceted relationship with climate change (Liverman and Ingram 2010).

There are different and controversial definitions of the MR (Brauch 2001, 2003). We adopt a medium concept that includes all the twenty countries with Mediterranean coastlines, plus Portugal, Serbia, Macedonia and Jordan. All these countries have a number of shared features that, for the purposes of this chapter, make it possible to consider them as forming a fairly homogenous region: (i) a common history; (ii) relatively similar cultures; (iii) a distinct Mediterranean economy; (iv) comparable natural and climatic characteristics, and environmental threats (Brauch 2010).

Climate change is expected to have, and to some extent already has had, multiple physical and socio-economic impacts on the MR. Physical impacts are characterized by the high variability of projected effects in different sub-regions. Coastal areas, large deltas and semi-arid zones will suffer the most (UNEP/MAP 2009). Physical impacts mainly consist in the increase of drought periods that will further limit the already constrained water availability, accelerate desertification processes, and threaten biodiversity. In general, physical effects coupled with anthropogenic activities are expected dramatically to increase environmental pressure in the entire Mediterranean area (IPCC 2007). As far as societal and economic aspects are concerned, it is widely agreed that these outcomes of changing climatic dynamics will severely affect Mediterranean agriculture (Iglesias et al. 2011; Giannakopoulos et al. 2009), fishing, tourism, coastal zones and infrastructure, and that they will ultimately endanger public health (UNEP/MAP 2009).

However, human security in the MR is not threatened by climate change alone. In fact, the MR has been facing several socio-demographic and economic challenges, ranging from the economic crisis to demographic changes, to political and social tensions. While these challenges are far from being settled, so that full appreciation of their effects on human security is hardly possible, it seems clear that they are already having, and possibly will have long in the future, effects on the Mediterranean peoples' capacity to "end, mitigate, or adapt to threats to their human, environmental, and social rights; have the capacity and freedom to exercise these options; and actively participate in pursuing these options" (Barnett et al., 2006 p. 18).

Owing to this overlap between exceptional environmental and social change trends, the MR is an especially interesting case for investigation of the intersections between climate change and human security. Because Parts 1 and 2 of this Handbook provide an exhaustive overview of the notion of human security and contextualize its features in the milieu of climate change, we neither analyze nor review these aspects here. Rather, we propose a measure of human security at national level that can serve to gain better understanding of human security, to scrutinize its connection with climate change in the MR, and ultimately to develop an ethical approach for raising its level in this region.

The chapter is structured as follows. It first conducts a review of current environmental and social change trends in order to highlight the most severe threats to human security in the MR, or sub-regions within it. It then carries out a quantitative indicator-based analysis of human security, the purpose being to identify and quantify the relevant determinants of human security in the region. In particular, the indicators are used to cluster Mediterranean countries (based on their similarity with respect to the indicators) in order to explore how countries differ in terms of human security dimensions. Finally, on the basis of the emerging evidence, the chapter proposes an ethical approach for the improvement of human security in the region where states assume the role of mediators of the factors that most significantly influence human security.

2. ENVIRONMENTAL AND SOCIAL CHANGE IN THE MEDITERRANEAN REGION

The MR is undergoing several environmental and social changes with the potential to change the environmental, institutional, demographic and cultural configurations of the region, and significantly to affect human security in it.

Table 10.1 *Summary of environmental and social change trends*

Trends		Sub-region	
		Southern Europe	MENA
Environmental change		Increased frequency of extreme events (especially droughts, heat waves, storms and wind storms) Higher average temperatures Reduced precipitations Sea level rise Increased variability	
Social change	Demography	Shrinking and ageing population	Growing and still young population
	Financial crisis and economic globalization	Serious economic crisis and slow recovery; Strong integration into the global economy	Economic crisis but recovery; limited integration into the global economy
	Political and social trends	Persistence of conflict (passive, active for Balkan region); Social mobilization for democratic reforms	Persistence of conflict (active); Social mobilization for democratic reforms

While it is necessary analytically to distinguish among the different environmental and social change trends (Table 10.1), it is important to bear in mind that they are closely interlinked, and that threats to human security often arise from the interplay among these trends in specific contexts. In fact, as made clear below, several environmental changes largely determined by climate dynamics interact with social ones, and they have the potential jointly to affect human security. More in detail, it is necessary to note that climate change, owing to its ramified and overarching impacts in the MR, can be seen as a *threat multiplier* (Brklacich et al. 2006; Dokos et al. 2008) because of its many potential interactions with other factors of human insecurity. For example, climate change is believed to be linked with violent conflict (Homer-Dixon 1994; Scheffran and Battaglini 2010; Hsiang et al. 2011), although the evidence is contradictory, given that several studies do not find confirmation of such a link (Barnett 2009; Koubi et al. 2012; Buhaug 2010; Tol and Wagner 2010). Climate change is also linked with migration (Afifi and Warner 2008; Feng et al. 2010; Warner 2010; Black et al. 2011), whereby migration often results from a closely intertwined set of factors, among which are also demographic (e.g. overpopulation), economic (e.g. unemployment), and political (e.g. conflict, lack of human rights and freedom) ones. Some authors also hypoth-

esize a causal, though indirect, connection between climate change and the Arab Spring (Johnstone and Mazo 2011).

2.1 Environmental Change

The MR is considered to be a climate change “hot spot” because of its high environmental vulnerability (Giorgi 2006; Scheffran and Battaglini 2010). Beside other sources of environmental stress, such as earthquakes, desertification and volcanic eruptions, that have traditionally characterized this region, in recent decades climate change has moved to centre stage by bringing ecosystems and human populations under increasing strain. With reference to the period between 1860 and 1995 and the central and western MR, for example, Piervitali et al. (1997) found several signs of climate change, among which a significant increase in heat waves, a rise in surface air temperature, and a reduction in cloudiness and precipitation. Similarly, on studying the risk of climate change for agriculture, Moonen et al. (2002) recorded change trends in extreme temperature and rainfall events, frost, flooding, and drought risks. Hoerling et al. (2011) also recorded a climate-related increase in Mediterranean droughts. These trends are already affecting ecosystems (e.g. animal and life cycles, Penuela et al. 2002) and human activities (e.g. agriculture, Ben Mohamed et al. 2002), and they are projected to continue and increase in magnitude in the next decades. Higher average temperatures are expected in the MR (Gibelin and Deque 2003; Giorgi et al. 2004), and, also in combination with reduced precipitations, are projected to cause longer droughts and increased or accelerated desertification (Gibelin and Deque 2003; Arnell 2004; Puigdefabregas and Mendizabal 1998; Black 2009; Bou-Zeid and El-Fadel 2002; UNDP 2009), and to reduce water availability in urban areas as well (Bigio 2009). Surprisingly, despite its importance, water scarcity is seldom on the agenda of political leaders in the MENA (Middle-Eastern and North African) countries (Sowers et al. 2010). The magnitude and frequency of such extreme events as heat waves, storms and windstorms is also expected to increase (Giannakopoulos et al. 2009; Maracchi et al. 2005; Schwierz et al. 2010). Furthermore, sea level rise is expected to affect coastal areas through increased soil salinity, coastal inundation and increased coastal erosion (Sánchez-Arcilla et al. 2011; Iglesias et al. 2011; Bigio 2009; Nicholls and Hoozemans 1996). Both marine and terrestrial ecosystems are expected to undergo significant modifications as a consequence of climate change (Turley 1999; Schroeter et al. 2005; Thuiller et al. 2005; Scarascia-Mugnozza et al. 2000; Metzger et al. 2006). While climate and environmental models tend to differ in terms of the projected magnitudes of the above-mentioned climate change effects, they are consistent in

showing that these trends are likely to be the ones that most affect ecosystems and human activities in the MR (Giorgi and Lionello 2008).

An important feature of climate change is induced variability in both its temporal and spatial dimensions. Interannual variability is projected to increase as a consequence of less regular meteorological patterns (Giorgi et al. 2004). The spatial variability of climate change effects is likely to be high in that it depends on the complex and diverse interactions of environmental trends with local physical and environmental conditions, and on the sensitivity, vulnerability and adaptive capacity of different natural and social systems (Ferrara et al. 2009; Grasso and Feola 2012).

The Environmental Vulnerability Index (EVI) (UNEP 2005) confirms the severity of climate change threats for the MR. The EVI, which also considers other sources of environmental threat such as pollution, biodiversity loss, and natural disasters, shows that climate change is the main driver of environmental vulnerability in the region (see Table 10.2). It also suggests that no clear sub-regional pattern can be identified, because almost all countries are highly vulnerable to climate change and related threats (e.g. desertification).

2.2 Social Change

We focus in what follows on four interlinked demographic, economic, political/institutional and social trends characterizing the MR that we consider to require closer attention from the relevant literature. A *caveat* is in order. While these challenges are far from settled, so that full appreciation of their effects on human security is hardly possible, it seems clear that they are already having, and possibly will have long into the future, effects on human security in the MR.

Demography

Demographic dynamics in the MR are characterized by a shrinking and ageing population in large parts of southern European countries, and by a growing and still young population in the MENA ones. Population is ageing especially in Spain, Italy, Portugal and Greece, where a very low or negative population growth rate and an ageing of both the entire population and the working-age population are observed (Gesano et al. 2009). The former Yugoslavian countries (i.e. Croatia, Serbia, Bosnia-Herzegovina, Montenegro, and Macedonia) are projected to experience a steadily ageing working population and a rapid increase in the elderly population (Gesano et al. 2009). Population ageing is projected to occur to a significant extent also in Albania and Turkey, where, however, the working-age population is expected to continue to increase at least until

2020 (Gesano et al. 2009). Although the MENA countries have begun the demographic transition, they are experiencing, and are projected to experience, a rapidly increasing population, with a growing but still limited elderly population and a young and increasing working-age population (Tabutin and Schoumaker 2005; Gesano et al. 2009; UNDP 2009).

These different trends are expected to create opposite socio-economic problems in different parts of the MR (Gesano et al. 2009). Southern Europe is facing, and will increasingly face, the challenge of funding its welfare and health care systems, which may prove to be particularly difficult under conditions like the present financial crisis (see below). The MENA countries, on the other hand, are facing, and will increasingly face, the challenge of creating jobs for a young and growing working-age population so as to fight unemployment, and consequently poverty and frustration (Laipson 2002; Assaad and Roudi-Fahimi 2007), which many argue are among the triggers of the so-called Arab spring (Al-Momani, 2011; Warf, 2011). Given the scant openness of the MENA countries to globalization (Noland and Pack 2004, see below), this may prove particularly difficult, and it may exacerbate other phenomena traditionally linked with population growth, such as urbanization (Cohen 2004), and international migration towards the MR's northern shore (which in turn could influence human security in North Mediterranean countries (i.e. European).

Financial crisis and economic globalization

Also with regard to economic globalization trends, the MR is characterized by a cleavage between countries on its northern and southern shores. Southern European countries have been strongly hit by the recent financial and economic crises (Verney 2009; Filippetti and Archibugi 2010). Greece, but also Portugal, Spain and Italy, have been among the European countries most seriously affected, although in different ways because of the different structures of their economic and financial systems (Escribano 2010; Armingeon and Baccaro 2011). Recovery is expected to be slow, especially amid current EU economic governance difficulties and market speculations.¹

The economic crisis has less severely impacted on Eastern European countries and the MENA ones. The latter, in particular, have begun a significant recovery (IMF 2010), although its future is uncertain (IMF 2012). As noted by Dabrowski (2010), economies relying little on external financing and trade have suffered less than more sophisticated economies. This relative isolation from the globalized economy, however, has significant drawbacks in terms of economic development. The MENA countries generally have a difficult relationship with globalization (Noland and Pack 2004) and an inward-looking model of development. The Index

of Globalization (Dreher et al. 2008), for example, shows that MENA countries with the exception of Israel are consistently lower than southern European ones in the ranking of globalized economies (Table 10.2). The economies of MENA countries are traditionally based on support by the public sector, the oil economy, remittances, and a limited openness to international markets (World Bank 2003; UNDP 2009), although sub-regional international integration has improved in the past two decades (Romagnoli and Mengoni 2009). Such a model of development is widely considered to be unsustainable due to changing conditions, among which the decline of oil resources and the volatility of oil prices, the increase in international competition, the pressure of internal labour markets (i.e. a rapidly growing working-age population), and the slowing of migration opportunities as a reaction of European countries to growing migration flows (World Bank 2003; Noland and Pack 2004; UNDP 2009). Despite the looming financial crisis, greater engagement in the global markets and translating the gains of economic growth into poverty reduction and human development are therefore considered critical factors for the MENA countries in the next decades (Amin et al. 2012; Aryveetey et al. 2011).

Political/institutional and social trends

In recent decades, the MR has seen the persistence of violent conflict (both intra- and inter-state) in several sub-regions, such as the Balkans, Cyprus, the Middle East and North Africa. Several, if not all, Mediterranean countries were involved in such conflicts at different times after World War II – although some countries experienced conflict on their territory (e.g. Balkan countries, Israel, Egypt, Syria, Jordan) while others did not (e.g. Spain, France, Italy). Conflicts are ongoing in some parts of the Mediterranean region (e.g. the Middle East). The Peace Index (IEP 2011), for example, shows that Mediterranean countries perform rather poorly on a global level. According to this index, which considers a variety of issues including internal and external conflict, military expenditures, criminality, and weapons, no Mediterranean country (with the exception of Portugal and Slovenia) ranks among the most peaceful 35 countries in the world. Moreover, several MENA countries perform particularly poorly (e.g. Israel, Turkey, Syrian Arab Republic, Libyan Arab Jamahiriya and Lebanon).

The MENA countries have been traditionally ruled by authoritarian regimes, and some scholars have argued that Arab culture and Islamic religion are not compatible with democracy (Al-Momani 2011; Warf 2011). Common explanations point out that democratic institutions in the MENA countries did not develop because of a combination of factors,

among them oil-affected economies and social interests, foreign aid, the Arab-Israeli conflict, and a sort of clustering effect in the sub-region (El-Badawi and Makdisi 2007; UNDP 2009; Diamond 2010). The recent wave of social mobilizations in favour of democratic reforms, commonly referred to as the Arab Spring (Sorenson 2011; Warf 2011), is expected to affect this political and social configuration (Al-Momani 2011; Warf 2011). By and large, the Arab Spring was fuelled by relatively highly-educated young cohorts, making widespread use of the new media (Warf 2011), which rebelled against the restriction of political freedoms, corruption, and the incapacity of the ruling elites to deal with persistent social and economic issues (e.g. inequality, unemployment) (UNDP 2009; Al-Momani 2011; Sorenson 2011; Warf 2011). However, serious doubts exist concerning its potential to produce lasting and widespread change. The “possibility for the creation of failed states or international interventions, and the necessity of governments to deal with large numbers of refugees, sectarian tensions, and deeply rooted economic problems” (Al-Momani 2011, p. 159), as well as the possible radicalization of religious forces (Sorenson 2011), are among possible backlashes. Moreover, there is the risk that Arab countries may undergo an incomplete democratic construction which ultimately leads to disappointment and a possible democratic rejection (Sorenson 2011).

3. MEASURING HUMAN SECURITY AND CLUSTERING THE MEDITERRANEAN REGION

Brklacich et al. (2006) provide a reference framework for the analysis of human security in the MR. Environmental and societal change refer to the two types of trends (i.e. double exposure) that influence the context for human security. As seen in the previous section, the main environmental change threat in the Mediterranean is climate change, which also interacts with other trends such as desertification and water availability. The societal change trends considered here are demographic, economic, social and institutional trends. These contextual factors influence the exposure and the responsive capacity via influence on the institutional context, control over and access to assets, and distribution of rights and resources (Brklacich et al. 2006).

Responsive capacity, finally, is linked to a set of fundamental functionings, in that the weaker a country is in these domains of well-being (or achievable functionings) that specify human security, the less are its institutional and social capacities and possibilities to carry out effective adaptation actions. Accordingly, adopted here is the notion of human security

Table 10.2 Environmental Vulnerability Index, Index of Globalization and Peace index for the Mediterranean countries

Country	Environmental Vulnerability Index ¹	Environmental Vulnerability Index (3 most policy relevant sub-indices)	Index of globalization (economic) ^{2,3}	Peace index ^{2,4}
Albania	Highly Vulnerable	Water, Desertification, Climate Change	86	63
Algeria	Vulnerable	Desertification, Water, Climate Change	108	129
Bosnia and Herzegovina	Vulnerable	Water, Desertification, Climate Change	65	60
Croatia	Highly Vulnerable	Water, Agriculture and fisheries, Human health aspects	41	37
Cyprus	Vulnerable	Human health aspects, Water, Agriculture and fisheries	11	71
Egypt	Vulnerable	Water, Human health aspects, Climate Change	109	73
France	Highly Vulnerable	Climate Change, Agriculture and fisheries, Desertification	25	36
Greece	Highly Vulnerable	Human health aspects, Water, Climate Change	39	65
Israel	Extremely Vulnerable	Human health aspects, Climate Change, Exposure to natural disasters	27	145
Italy	Extremely Vulnerable	Water, Human health aspects, Desertification	46	45
Jordan	Vulnerable	Human health aspects, Water, Climate Change	52	64
Lebanon	Extremely Vulnerable	Human health aspects, Water, Climate Change	na	137
Libyan Arab Jamahiriya	At risk	Desertification, Water, Agriculture and fisheries	na	143

Macedonia, FYR	Highly Vulnerable	Human health aspects, Water, Agriculture and fisheries	64	78
Malta	Extremely Vulnerable	Human health aspects, Water, Climate Change	4	na
Montenegro	na	na	18	89
Morocco	Vulnerable	Water, Climate Change, Desertification	107	58
Portugal	Highly Vulnerable	Climate Change, Water, Agriculture and fisheries	20	17
Serbia	na	na	73	84
Slovenia	Highly Vulnerable	Human health aspects, Water, Agriculture and fisheries	23	10
Spain	Highly Vulnerable	Agriculture and fisheries, Desertification, Water	31	28
Syrian Arab Republic	Highly Vulnerable	Water, Human health aspects, Desertification	131	116
Tunisia	Vulnerable	Water, Human health aspects, Desertification	71	44
Turkey	Highly Vulnerable	Water, Desertification, Human health aspects	95	127

Notes:

1. UNEP (2005).
2. Position in the global ranking. Year 2011.
3. Dreher (2006), Dreher et al (2008) (see also: <http://globalization.kof.ethz.ch/>). Year 2008.
4. Institute for Economics and Peace (2011). Year 2009–2010.

put forward by Alkire, who views it as the protection and promotion of a limited number of aspects of well-being which constitute its “vital core” (Alkire 2003, p. 2), the “central component of human well-being” (UNU 2007, p. 6). On this view, the protection of human security does not include all aspects of human well-being, but only the crucial ones. It is worth noting that, in our opinion, as thus understood the notion of vital core does not have a precise theoretical meaning; rather, it “may be specified in terms of human rights or capabilities related to absolute poverty” (Alkire 2003, p. 25). Therefore, the basis and epistemological foundation of this notion of human security consist mainly in practical reasons; and, in fact, the expression “human security” is employed in this chapter according to this perspective.

3.1 Methodology

Following King and Murray (2002), and Brklacich et al. (2006), eight indicators were selected to cover the economic, social, institutional and environmental dimensions of human security (see Table 10.3).

Consistently with the definition of human security provided above, an indicator set was selected to cover the vital core aspects of human security. This resulted in fewer indicators than proposed, for example, by Lonergan et al. (2000). Finally, a balanced number of indicators per dimension were adopted.

By and large, we argue that these indicators represent the key factors whereby countries and their peoples can “end, mitigate, or adapt to threats

Table 10.3 Correspondence between the indicator set used in this study and three relevant frameworks

Indicator	King and Murray (2006)	Brklacich et al (2006)	Lonergan et al 2000
GNI	Income	Assets	Economy
GINI	Income	Distribution of resources	Economy
HALE at birth	Education	Assets	Social
School life expectancy	Health	Assets	Social
ISCED 1–6			
Voice and accountability	Democracy	Institutions	Institutions
Government effectiveness	Democracy	Institutions	Institutions
IRWR per capita	–	Ecological context	Environment
Agricultural area per Capita	–	Ecological context	Environment

to their human, environmental, and social rights; have the capacity and freedom to exercise these options; and actively participate in pursuing these options” (Barnett et al. 2006, p. 18).

Data for the indicators were collected from secondary sources such as United Nations (UN), World Bank (WB), Food and Agriculture Organization (FAO) and UNICEF. It should be warned that the latest data available may be – given the extreme dynamic of the MR pointed out above – relatively out-dated: if fact, they refer largely to 2009–10.

The groups of countries were identified by means of a cluster analysis based on their similarity with respect to the human security dimensions (indicators) considered.²

Finally, the statistical difference between the clusters for each of the indicators of human security was tested using the Kolmogorov-Smirnov Z non-parametric test.

3.2 Results

Indicators of human security

Table 10.4 shows the indicator values for each of the 24 Mediterranean countries considered.

Figure 10.1 graphically represents the distribution of the Mediterranean countries in relation to pairs of selected indicators, i.e. economic, social, institutional and environmental. These graphs show that the MENA countries, with the exception of Israel, tend to perform worse than other Mediterranean countries. The performance of Eastern European countries varies, with Slovenia often showing values close to Western European ones.

Three clustering options were generated, i.e. with two, three and four clusters. The option with two clusters corresponded consistently (i.e. independently from the clustering method) with two groups of almost equal size (i.e. 11 and 10 countries). The options with three and four clusters consistently yielded the same group of 11 countries and also consistently set France aside from the rest of the countries. The option with four clusters, however, generated two groups with very few countries. For this reason, this option was dropped in the following analysis, and the one with three clusters was preferred. Moreover, in order to facilitate the statistical analysis, France was grouped with the cluster to which it was most similar (cluster 3).

Interestingly, the MENA countries plus Albania, Macedonia FYR, Bosnia and Herzegovina, and Turkey all clustered together independently of the clustering method adopted. This suggests a very strong similarity in terms of the factors determining human security among these countries.

Table 10.4 Indicator values

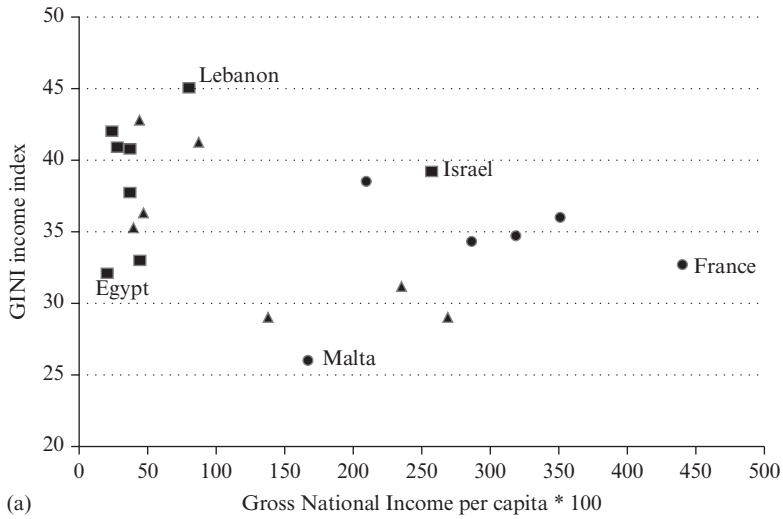
Country	GNI	GINI	HALE at birth	School life expectancy ISCED 1-6	Voice and accountability	Government effectiveness	Internal Renewable Water Resources IRWR per capita	Agricultural area per capita
Albania	3950	35.3	64	11.3	0.158	-0.204	8504.6	0.357
Algeria	4420	33.0	62	12.8	-1.044	-0.591	332.2	1.219
Bosnia and Herzegovina	4700	36.3	67	13.2	-0.048	-0.646	9056.1	0.569
Croatia	13810	29.0	68	13.9	0.559	0.639	8276.6	0.271
Cyprus	26940	29.0	70	14.2	1.062	1.320	913.3	0.184
Egypt	2070	32.1	60	11.0	-1.118	-0.300	23.4	0.044
France	43990	32.7	73	16.1	1.260	1.442	2929.1	0.477
Greece	28630	34.3	72	16.5	0.882	0.608	5197.1	0.740
Israel	25740	39.2	73	15.4	0.580	1.095	107.7	0.070
Italy	35080	36.0	74	16.3	1.040	0.517	3137.2	0.234
Jordan	3740	37.7	63	13.1	-0.849	0.281	114.0	0.165
Lebanon	7970	45.0	62	13.5	-0.334	-0.675	1314.0	0.168
Libyan Arab Jamahiriya	12020	na	64	na	-1.889	-1.118	98.6	2.526
Macedonia, FYR	4400	42.8	66	13.3	0.129	-0.136	2647.1	0.528
Malta	16690	26.0	72	14.4	1.205	1.110	124.7	0.023

Montenegro	6550	36.9	65	na	0.299	-0.031	na	0.828
Morocco	2790	40.9	62	10.5	-0.791	-0.109	894.7	0.971
Portugal	20940	38.5	71	15.8	1.211	1.207	3587.3	0.330
Serbia	5990	28.2	65	na	0.318	-0.154	na	0.685
Slovenia	23 520	31.2	71	16.8	0.987	1.163	9501.3	0.248
Spain	31 870	34.7	74	16.4	1.187	0.936	2550.2	0.639
Syrian Arab Republic	2410	42.0	63	11.3	-1.633	-0.609	350.2	0.678
Tunisia	3720	40.8	66	14.5	-1.269	0.414	406.5	0.961
Turkey	8730	41.2	66	11.8	-0.119	0.352	3020.2	0.540

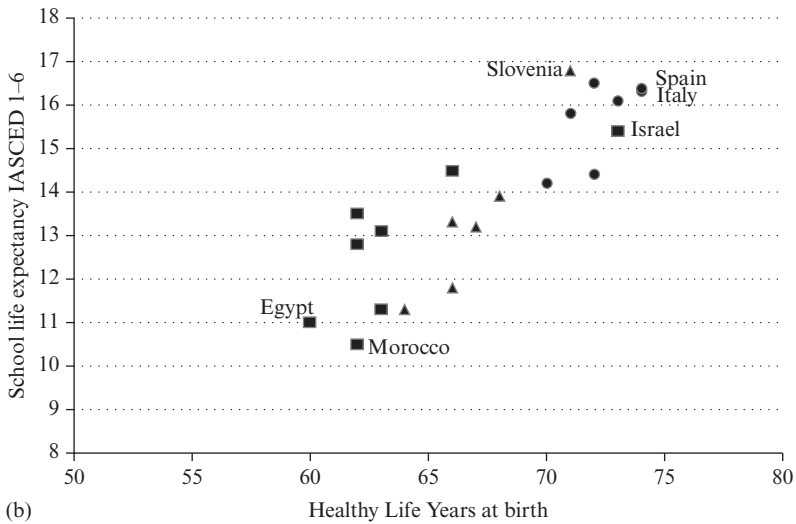
Notes:

na = Data not available. Units: USD (GNI per capita), Years (HALE at birth, School life expectancy ISCED 1-6), cubic meters per year (IRWR per capita), hectares (Agricultural area per capita), dimensionless (GINI, Voice and accountability, Government effectiveness).
Reference years: 2007 (HALE at birth, IRWR per capita, Agricultural area per capita), 2004-2008 (School life expectancy ISCED 1-6), 2009 (GINI, Voice and accountability, Government effectiveness), 2000-2010 (GINI).

Sources: WB (GNI per capita, GINI, Voice and accountability, Government effectiveness), UN (HALE at birth, IRWR per capita), UNESCO (School life expectancy ISCED 1-6), FAO (agricultural area per person).



(a)



(b)

Notes: Squares stand for MENA countries (Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Syrian Arab Republic, and Tunisia); triangles stand for Eastern European countries (Albania, Bosnia and Herzegovina, Croatia, Macedonia FYR, Slovenia and Turkey); circles stand for Western European countries (Cyprus, France, Greece, Italy, Malta, Portugal, Spain). Serbia and Montenegro are not plotted due to missing data.

Figure 10.1 Distribution of the Mediterranean countries in relation to economic (a), social (b), institutional (c), and environmental indicators (d)

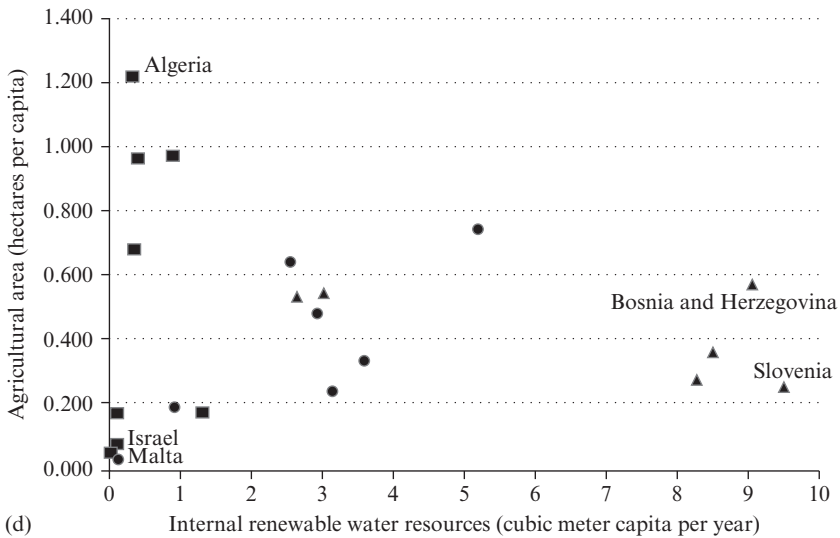
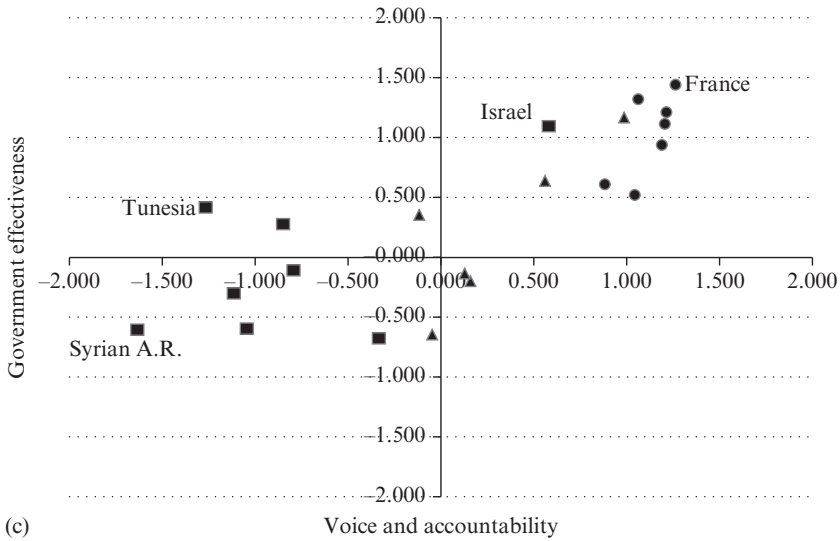


Figure 10.1 (continued)

It is also remarkable that France set aside from all other countries in the clustering options with three or four clusters (although, as said, France was allocated to the most similar cluster in order to carry out the analysis). This suggests that France might actually be in a different condition from all other countries, EU countries included. Serbia and Montenegro, which

Table 10.5 *Clusters generated (two- and three-cluster options)*

Cluster	Two clusters	Three clusters
Cluster 1	Albania, Algeria, Bosnia and Herzegovina, Egypt, Jordan, Lebanon, Macedonia FYR, Morocco, Syrian Arab Republic, Tunisia, Turkey	Albania, Algeria, Bosnia and Herzegovina, Egypt, Jordan, Lebanon, Macedonia FYR, Morocco, Syrian Arab Republic, Tunisia, Turkey
Cluster 2	Croatia, Cyprus, France, Greece, Israel, Italy, Malta, Portugal, Slovenia, Spain	Croatia, Malta, Portugal, Slovenia
Cluster 3	–	Cyprus, France, Greece, Israel, Italy, Spain

were not inputted in the clustering process due to missing data, presented a profile similar to that of countries in cluster 1 for the two-cluster option, and of cluster 2 for the three-cluster option (Table 10.5).

In regard to the remaining countries, the option with three clusters gives somewhat deeper insight into the potential differences among countries at a higher level of human security. Among those, Croatia, Malta, Portugal and Slovenia seem to differ from Cyprus, Greece, Israel, Italy (and France).

Table 10.6 shows the mean indicator values and standard deviations for different clusters of countries. The Kolmogorov-Smirnov Z test was performed to explore the difference between clusters. This table shows that the clusters are indeed statistically significantly different for most indicators. The indicators belonging to the environmental dimension constitute the sole, but interesting, exception. The differences are particularly clear among the 11 countries in cluster 1 and all the other countries. In the three clusters option, the only statistically significant difference between clusters 2 and 3 is that of GNI.

These results confirm those obtained using a different index, and indeed for a different but somehow akin dimension, i.e. adaptive capacity, by Grasso and Feola (2012) in the same region. In particular, the results show a North-South divide whereby MENA countries seem to perform significantly worse than EU countries. Surprisingly, Turkey, Bosnia and Herzegovina, Macedonia and Albania are consistently clustered together with MENA countries. The most marked differences between MENA and other Mediterranean countries are observed with respect to social, economic and institutional factors determining human security (see tables and figures).

Table 10.6 Mean and standard deviation of indicators for different clusters of countries

Indicator	2 clusters option				3 clusters option				All countries			
	Cluster 1 (n = 11)		Cluster 2 (n = 10)		Cluster 1 (n = 11)		Cluster 2 (n = 4)		Cluster 3 (n = 6)			
	Mean	Stdv	Mean	Stdv	Mean	Stdv	Mean	Stdv	Mean	Stdv		
GNI (USD)	4445	2113***	26721	8883	4445	2113**	18740	4328**	32042	6773	15053	12950
GINI	38.8	4.2*	33.1	4.3	38.8	4.2*	31.18	5.33	34.3	3.4	36.1	5.1
HALE at birth (years)	63.7	2.2***	71.8	1.9	63.7	2.2**	70.5	1.7	72.7	1.5	67.6	4.6
School life expectancy	12.4	1.3***	15.6	1.1	12.4	1.3*	15.2	1.3	15.8	0.9	13.9	2.0
ISCED 1-6 (years)												
Voice and account-ability	-0.629	0.615***	0.957	0.254	-0.629	0.615**	0.991	0.306	1.002	0.244	0.145	0.954
Government effectiveness	-0.202	0.410***	1.004	0.318	-0.202	0.410**	1.030	0.264	0.986	0.373	0.372	0.714
IRWR per capita (cubic meter per year)	2424.0	3298.2	3632.5	3205.8	2424.0	3298.2	5372.5	4328.5	2472.4	1794.6	2999.4	3232.1
Agricultural area per capita (hectares)	0.564	0.374	0.322	0.233	0.564	0.374*	0.218	0.135	0.391	0.269	0.448	0.331

Note: Significant difference between clusters (cluster 1 vs. cluster 2, and cluster 2 vs. cluster 3): *** 1%, ** 5%, * 10% (Kolmogorov-Smirnov Z).

4. AN ETHICAL APPROACH FOR THE IMPROVEMENT OF HUMAN SECURITY IN THE MEDITERRANEAN REGION

The stark North-South divide made clear by the clustering analyses, whereby EU Mediterranean countries consistently rank better than the others in the region, especially in terms of non-environmental factors determining human security, prompts significant considerations and implications regarding the role of states as mediators of human security, and more generally in regard to the relationship between human security and climate change in the MR. The existence of countries (by and large those belonging to cluster 1 in the two-cluster analysis of section 3) in the region with an insufficient/low level of human security urges identification of subjects or groups of subjects that are responsible for remedying a morally unacceptable situation otherwise likely to continue unabated.

To this end, we adopt here an international political theory perspective that endorses a statist focus. Accordingly, states are agents of justice (Erskine 2008) and have moral obligations that they are eventually reasonably compelled to observe (Nardin 2006, 2008). Furthermore, we consider states in a regional context. A regional approach for addressing human security is feasible only under the following simultaneous conditions: (i) the physical vulnerability of the region is high, so that it is possible to envision a process of “bounding” which requires that states share (a) relevant characteristic(s) which leads to definition of a “community of place” irrespective of national boundaries (Newman 2003); (ii) within this community development, physical vulnerability and the means to deal with it are unevenly allocated. The MR, as the clustering unambiguously makes clear, fulfils both these conditions: the sharing of the same likely climate impacts and of similar physical vulnerabilities facilitates closeness among countries of the region which might be the foundation for the emergence of a regional community of place. At the same time, there is great heterogeneity in the levels of social vulnerability and adaptive capacity. As a matter of fact, two relevant groups of countries can be identified in the MR with regard to human security: (i) those that have sufficient/higher levels of human security; (ii) those that have an insufficient/lower level of human security. Belonging to the first group (cluster 3, three-cluster analysis) are Cyprus, France, Greece, Israel, Italy and Spain; to the second (cluster 1, two-cluster analysis) Albania, Algeria, Bosnia and Herzegovina, Egypt, Jordan, Macedonia FYR, Morocco, Syrian Arab Republic, Tunisia, Turkey.

Given these two features, the “regionalization” of human security makes it, in our opinion, much easier to consider its – immoral – distribution across the MR. Indeed, in principle, every country in the region has at the

same time, yet with very different proportions, a responsibility to promote human security, and to some, yet greatly differentiated, extent suffers from inadequate levels of human security. However, it can be argued that, on ethical grounds, (i) there are countries that have the possibility and the responsibility to promote human security; and (ii) others that, because of their higher social vulnerability, should be supported in attaining sufficient/higher levels of human security. On practical grounds, for instance, Grasso and Feola (2012) have shown that a similar approach based on responsibility and (lack of) adaptive capacity can be usefully applied to agricultural adaptation in the MR.

4.1 Remedial Responsibility

To justify the former claim, it is first necessary to frame and vindicate a suitable notion of responsibility. It might be said that a subject can be responsible for a certain action that has already occurred. But it is also possible to argue that a subject is responsible for an outcome that she/he/it is expected to achieve in the future. The first kind of responsibility is defined as retrospective responsibility (Miller 2007; Erskine 2003): it pertains to the subject that created a bad situation, even unintentionally (Miller, 2007), and entails that the benefits and burdens fall on her/him/it (Miller 2004). The second kind of responsibility is instead defined as remedial or prospective (Miller 2007; Erskine 2003) and relates to the subject in charge of remedying the bad situation. With this distinction in mind and acknowledging the nature of human security and the results of the clustering analyses carried out, it is possible to argue that retropective responsibility is ruled out both by the no-harm principle (Shue 1996), since there is no subject that directly brought about harm to others by act or by omission, and by the principle of historical justice (Gardiner 2004) since an insufficient/lower level of human security does not depend on any specific actions. On the other hand, instead, higher-level human security EU Mediterranean countries should be held remedially responsible in the first instance. In fact, according to Miller's (2001) analysis of remedial responsibility, two principles expressly demand that EU Mediterranean countries support and promote human security in the weaker areas of the region. First, the principle of community, which states that when people are linked together by ties arising from shared activities and commitments, by common identities and history, as in the case of the Mediterranean region (Brauch 2010), they have special mutual responsibilities greater than those that they have towards outsiders; second, the principle of capacity, which states that those with a greater capacity to act have a special obligation to do so.

Consequently, states belonging to the MR that have the ability to pay and capacity to act should be held remedially responsible towards other Mediterranean countries characterized by scant human security.

4.2 Social Vulnerability

The ethical relevance of insufficient/low human security states – that is, of the second claim advanced above – is fortunately more straightforward to vindicate. The degree of vulnerability to climate impacts ought to be considered when characterizing such states ethically. It is useful to refer to a starting-point notion of vulnerability, which as regards social systems is also termed “social vulnerability” (Brooks et al. 2005; Kelly and Adger 2000). This perspective underlines the centrality of the human dimension, in that it focuses on prior damages and not on future stresses, and makes social vulnerability broadly understandable as a state of well-being pertaining directly to individuals and social groups, and whose causes are related not only to climate impacts but also to social, institutional and economic factors such as poverty, class, race, ethnicity, gender (Paavola and Adger 2006). In the context of climate change, the social vulnerability produced by climate impacts can be assumed to endanger a number of critical aspects of well-being: those which, in fact, constitute its vital core and which ultimately define the notion of human security adopted here (see above). The latter thus becomes the metric of social vulnerability itself. Hence it is the compromising of this notion of human security, which encompasses the ability to convert resources into valuable actions against climate impacts, that characterizes the ethical significance of low-level human security countries. What, therefore, is ultimately the moral imperative for putting the most socially vulnerable first, or more precisely, for using human security as the criterion for defining the ethical status of Mediterranean states? Several general constructs of justice validate this imperative. For instance, many liberal theories of justice show particular concern for the weakest parties with least human security. However, there are also universal principles of justice which postulate that people have a moral right not to suffer from the adverse effects of climate change. More specifically, Shue’s third general principle of equity of guaranteed minimum (Shue 1999) states, from a sufficientarian standpoint, that those who have less than enough for a decent human life should be given enough, and that being socially vulnerable means being deprived and having far less than enough. Hence these subjects should be given the amount of assistance needed to reach a level of human security sufficient for them to cope with, and to recover from, climate impacts.

In light of these ethical considerations, we argue that it is possible to

divide Mediterranean countries into two groups: the group of countries ethically bound to support human security; and that of countries with insufficient/low level of human security. Practically, we adopt a prudential and inclusive perspective – that is, the three-cluster one in the first case – in order to include only the highest-ranking countries, and the two-cluster one to include the largest possible number of countries characterized by insufficient/lower human security. Belonging to the first group (cluster 3, three-cluster analysis) are Cyprus, France, Greece, Israel, Italy and Spain; to the second (cluster 1, two-cluster analysis) Albania, Algeria, Bosnia and Herzegovina, Egypt, Jordan, Macedonia FYR, Morocco, Syrian Arab Republic, Tunisia, Turkey.

5. CONCLUSIONS

The review of the relevant literature has unambiguously shown that climate change has numerous and closely interlinked physical and socio-economic impacts that magnify the threats to human security in the MR. Our empirical analysis has shown that there exists a significant divide within the area under scrutiny whereby EU countries have much higher levels of human security than MENA ones. Importantly, the weakness factors of MENA countries are to be ascribed mainly to social, economic and institutional factors producing human security. The unbalanced levels of human security and of its determinants that characterize the MR move the discourse towards the ethical domain, and more precisely to the development of a regional ethical approach. This we have framed in terms of remedial responsibility and social vulnerability, where a group of states have the responsibility of promoting human security in the weaker states of the region. In particular, in light of the empirical analysis carried out in section 3 and of the theoretical considerations put forward in section 4, it seems possible to claim that cluster 3, three-cluster countries, are ethically responsible for the promotion of the social, economic and institutional factors determining human security in more socially vulnerable cluster 1, two-cluster countries.

We believe that the inclusion of the ethical dimension in a regional approach to human security in the MR may promote its overall increase, and it may mitigate the consequent conflicts among interests, so that the impacts inflicted by climate change on the factors determining human security can be effectively addressed. We argue that, in regions characterized by high degrees of inequality, such as the Mediterranean basin, ethical considerations may also provide reasoned elements for debate among regional stakeholders with regard to the development of a

successful strategy for improving human security that devises agreed and unified initiatives. Otherwise, the emerging haphazard approach, in which the notion of human security itself is fragmented and unclear, and even more so its determinants, will lead to the ineffective use of resources to increase the well-being of the entire region.

NOTES

1. See, for instance, the view of the European Central Bank President Mario Draghi in a Q&A session with the *Wall Street Journal* on 23 February 2012 (Internet: <http://blogs.wsj.com/eurocrisis/2012/02/23/qa-ecb-president-mario-draghi/>, accessed 12 March 2012).
2. Clusters were first created by using ten different methods, i.e. resulting from the combination of two measure calculations (Minkowski at cubic power, and Squared Euclidean Difference) and five clustering methods (Furthest neighbour, Ward's method, Within-group linkage, Between-group linkage, Centroid clustering). The reason for using several methods was the need to achieve reliable data, since clustering analysis is often sensitive to the method adopted. For each method, three solutions were generated, i.e. with 2, 3 and 4 clusters of countries. The consistency between clusters generated with different methods was verified through Spearman's test (see Johnson and Wichern (1998) for further details on the clustering methods).

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