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**THE MEDITERRANEAN  
IN THE CARBON  
MICROWAVE:**

**SEVERE CLIMATE THREAT,  
MORE INEQUALITY AND  
THE END OF COASTAL  
TOURISM**

*An overview of global risks in the  
Mediterranean in the 21st century*

**JOAN BUADES**



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OF COASTAL TOURISM**

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“They are not the objective conditions of a situation that determine how people behave but the way in which these are perceived and interpreted”

*Harald Welzer*

According to all reliable scientific scenarios, the Mediterranean is one of the world's regions where the effect of climate change will be most pronounced, together with Central America, the Caribbean and large areas of the Indian and Pacific Oceans. Temperatures have already started to increase, and will rise even more steeply from the second half of the century onwards, especially in the Eastern Mediterranean. Rainfall, on the other hand, will become increasingly scarce, especially in the Southern Mediterranean. Sea levels will continue to rise, and at ever-increasing rates as the century progresses, depending on what happens to the Arctic ice cap. The desert will expand and there will be less water; this effect will be most intense in the Southern Mediterranean, but its impact on the North-western Mediterranean should not be underestimated.

At the same time, the Mediterranean is undergoing profound demographic and social changes. The population is growing and regenerating at a dizzying pace in the South and the Levant, whereas in the North it is stagnant and ageing. Far and wide, coastal areas are being engulfed by urbanisation and human occupation. Despite the existence in the South of important mineral resources, mainly oil and natural gas, the income gap and, above all, the social inequalities between rich and poor in Mediterranean societies are increasing within and between the North and South. Meanwhile, as climate change brings about the desertification of Sub-Saharan Africa, there is an unseen but enormous influx of environmental refugees at the gates of North Africa who are intent, at whatever cost, on reaching the *Eden* of Europe.

Economically, tourism has become the dominant economic activity throughout virtually the entire region. In fact, the Mediterranean is the great swimming pool of the world, and has ranked as the first international tourist destination for decades. At the same time, merchandise logistics in large port areas throughout the region and export agriculture in the South and the Levant constitute the other two major strategic alternatives for the present regional economy. Climate change, however, increasingly threatens the future of these three economic bets. The days of coastal tourism reliant on low-cost airlines may be numbered.

On the eve of the end of the term of the Kyoto Treaty and following the failure of the Copenhagen summit, the last major attempt to achieve a comprehensive and binding treaty on global climate protection, Mediterranean societies are facing an uncertain and dangerous future with neither institutions nor collaborative tools that would help to promote a social and climatic transition aimed at ensuring humane, democratic and healthy living conditions for coastal societies. Neither a purely nominal Mediterranean Union nor a solely mechanical Blue Plan will be sufficient, and the lack of full cooperation between Northern NGOs and North African communities represents a further stumbling block. The sense of a shared sea was lost during the second half of the 20th century, and it has become imperative to restore the idea of the Mediterranean as a common living space, to strengthen the ties of egalitarian cooperation between North and South and to prioritise the implementation of projects to protect a shared breathable atmosphere based on the idea of global climate justice promoted by a new global, democratic citizenship.

## 2. SCIENTIFIC EVIDENCE: A CRITICAL CLIMATE CHANGE HOT SPOT

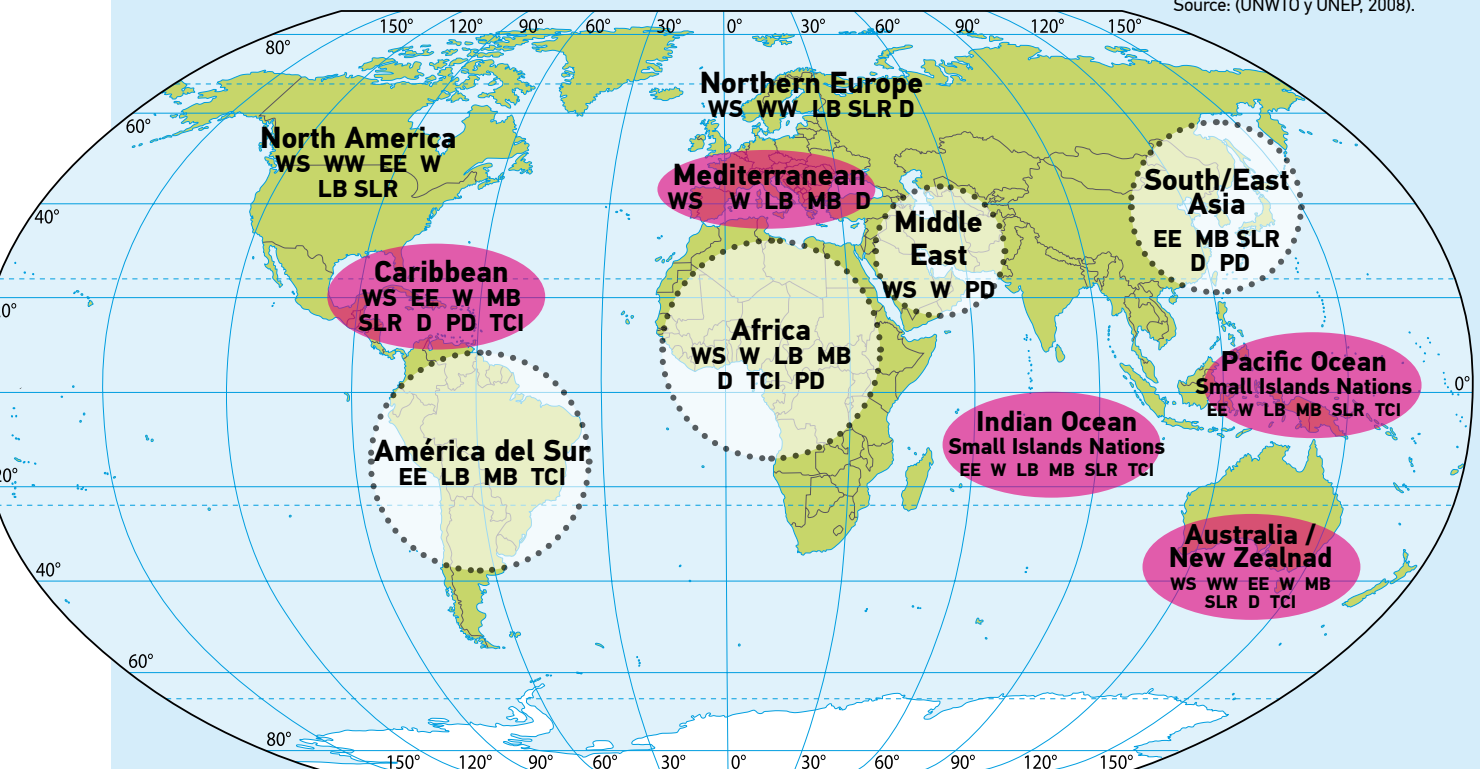
The Mediterranean Basin is a region that occupies 6% of the world's land surface area, and is located at the confluence of Southern Europe, North Africa and the Levant. It enjoys a mild climate, transitional between temperate, tropical and subtropical climates, with four seasons and seasonal rainfall marked by a notable water stress in summer. Earlier this century, this benevolent climate allowed the region to accommodate **6.7% of the world's population** (about 469 million people), distributed across 21 states and territories. Economically, it generates **13% of the global economy's GDP**, with tourism being its principal economic activity, since it receives 32% of all international tourist traffic (Hallegatet, Somot, & Nassopoulos, 2009).

In an initial analysis of the impact that climate change will have on the area, the most important aspect is the certainty that the Mediterranean will become one of the hottest places on the planet in the course of this century. Together with the Caribbean and Central America (Buades, 2010a), the coasts of the Indian and the Pacific Oceans and much of Oceania, it will be one of the regions where the rise in temperatures will exceed the global average predicted in the last IPCC report (Intergovernmental Panel on Climate Change, United Nations) for 2100 (between +1.1°C and +6.4°C), published in 2007 and known as the Fourth Report [AR4]. Although this may seem negligible, when we consider that the increase in average global temperatures over the last million years has fluctuated within a range of between +4°C and +7°C, the potentially radical impact on our way of life as humans on Earth becomes clear (IPCC, 2007: 465).

MAPA 1

### GEOGRAPHY OF THE CLIMATIC HOT SPOTS WHERE TOURISM WILL BE AFFECTED

Source: (UNWTO y UNEP, 2008).



- |                                 |                                   |   |
|---------------------------------|-----------------------------------|---|
| WS = warmer summer              | MB = marine biodiversity loss     | TCI = travel cost increase from mitigation policy |
| WW = warmer winters             | W = water scarcity                |   |
| EE = increase in extreme events | PD = political destabilization    |   |
| SLR = sea level rise            | D = increase in disease outbreaks |   |
| LB = land biodiversity loss     |                                   |   |

Hotspot

Regional information gap

Paradoxically, this finding coincides with the widespread protest raised by regional specialists concerning the lack of detail about this extreme risk to the Mediterranean in the scenario projections given in the AR4, a risk which the scientific community - with the exception of those experts in the pay of the oil and coal cartels - acknowledges as highly credible (Giorgi & Lionello, 2008; Billé, Kieken, & Magnan, 2009; Calbó Angrill, Sanchez-Lorenzo, Cunillera, & Barreda-Escoda, 2010; Lejeusne, Chevaldonné, Pergent-Martini, Boudouresque, & Perez, 2010).

In fact, pending the Fifth Report of the IPCC (expected in 2014), which will focus on both a regional breakdown of the predictions (“downscaling”) and on different periodization - the short and long term effects over the course of this century - (IPCC, 2007), there is currently an authentic deluge of teams and studies seeking to refine the most predictable scenarios in the region, aware of the enormous threat it faces. **From the physical standpoint, there are three reference indicators** which reveal the extent of climate change: warmer temperatures, fluctuations in rainfall and rising sea level.

In relation to **temperature variations** on a global scale, an increased maximum average of +2.8°C (IPCC, 2007, p. 809-810) by 2100 with respect to the period 1980-1999 is predicted in the reference scenario accepted by most climate scientists: the A1B. This is usually regarded as the “intermediate” scenario, since it combines the development of clean energies with improved technologies for energies that are lethal for the climate. As illustrated by the sustained increase in oil and coal consumption over the last two decades, flagrant non-compliance with the Kyoto Protocol [1997-2011] and the failure of the international community to reach agreement at the critical Copenhagen Summit, no matter how high the projections for the Mediterranean (which could reach +4.4°C by the end of the century, one degree more than the average global prediction!), they are too optimistic. At best, it is well above, more than double, the maximum temperature increase ceiling of +2°C which the large industrial nations agreed on in the Copenhagen Accord as a basis for stabilising the climate between now and the 22nd century.

**TABLE 1**

**TABLE 1: RANGE OF TEMPERATURE SCENARIO IN THE MEDITERRANEAN (21ST CENTURY)**

Emissions Scenarios	Temperature Increase (°C)		Rising Sea Level (cm)
	Best estimate	Likely range	
B1	1,8	1,1-2,9	18-38
A1T	2,4	1,4-3,8	20-45
B2	2,4	1,4-3,8	20-43
A1B	2,8	1,7-4,4	21-48
A2	3,4	2,0-5,4	23-51
A1FI	4,0	2,4-6,4	26-49

Source: Calbó Angrill, Sánchez-Lorenzo, Cunillera, & Barreda-Escoda, 2010, p. 196.

If the choice of reference scenario is not neutral, as evidenced above, these considerations draw attention to **a more realistic scenario, that of “business as usual”** (paying no heed and continuing to grow and pollute as before), that is, the A2. This scenario reflects the three major trends that to date appear to be the most likely: a significant growth in the human population, an increase in economic inequality both within societies and between regions, and a lack of any positive initiative to mitigate emissions of CO2 and other greenhouse gases. For the planet as a whole, this would result in a much worse average maximum increase of +3.4°C. However, in the case of the Mediterranean this could reach 2 degrees more, **up to +5.4°C**. This would imply a greater rise in temperatures (+5°C) than has occurred over the last 10,000 years

## Heat wave in Summer 2003, 52.000 deaths

In 2003, Europe suffered the hottest summer since 500 years. 52.000 people died of heat stroke in what could be a precedent that can happen with the acceleration of climate change during the 21 century.

[http://www.earth-policy.org/plan\\_b\\_updates/2006/update56](http://www.earth-policy.org/plan_b_updates/2006/update56)

since the most recent ice age, and would lead to a level of global warming over the course of one century equivalent to that which occurred during the last million years of the planet's climatic history. Whatever happens, it should not be forgotten that no matter how radically mitigation policies for reducing greenhouse gas emissions are changed, much of this increase in temperatures cannot be halted. Not surprisingly, "the typical time scale for achieving a new balance in CO<sub>2</sub> concentrations is about 200 years" (Calbó Angrill, Sanchez-Lorenzo, Cunillera, & Barreda-Escoda, 2010, p. 195).

Such global warming would not be uniformly distributed. On the one hand, based on a comparison between the periods 1980-1999 and 2080-2099 and with reference to the A2 scenario, the pattern would present seasonal variations. Thus, spring temperatures would show an increase of about +3°C throughout the Basin; in autumn they would rise by +4°C. In the Western Mediterranean, the months of June and July would witness increases of above +4°C, whilst in the Northern Mediterranean and the Levant, this extreme annual increase in temperature would occur in the months of August and September. The peak in temperature on the European side, which could reach +6°C, would occur in summer in the South and in winter in the Levant (Somot, Sevault, Déqué, & Crépon, 2008, p. 125). In terms of time, **the decade from 2020 to 2030 would experience particularly severe warming** (Hertig & Jacobeit, 2008). In addition, variations between regions are also predicted; these would be lower in the Levant and higher in the Aegean, although these differences are in mere tenths of degrees within a general framework for increases of between +2°C and +5.4°C.

Taking the IPCC AR4 as their scientific basis, further studies carried out on more specifically defined areas in order to refine these predictions have shown that the reality may be worse than originally thought. Thus, according to the PRUDENCE project promoted by the European Union (EU), in the case of the Iberian Peninsula (in the Northwestern Mediterranean, a region often considered less vulnerable to climate change than the South and the Levant), the increase in temperature in winter scenarios would be in the range of between +2.4°C and +4.1°C, while in the summer it could fluctuate between +4.1°C and an extremely torrid +7.6°C. Meanwhile, in Catalonia, although rainfall in the winter might decline by only -2.5%, in the summer this could be closer to -50% (Calbó Angrill, Sánchez-Lorenzo, Cunillera, & Barreda-Escoda, 2010, p. 205-208).

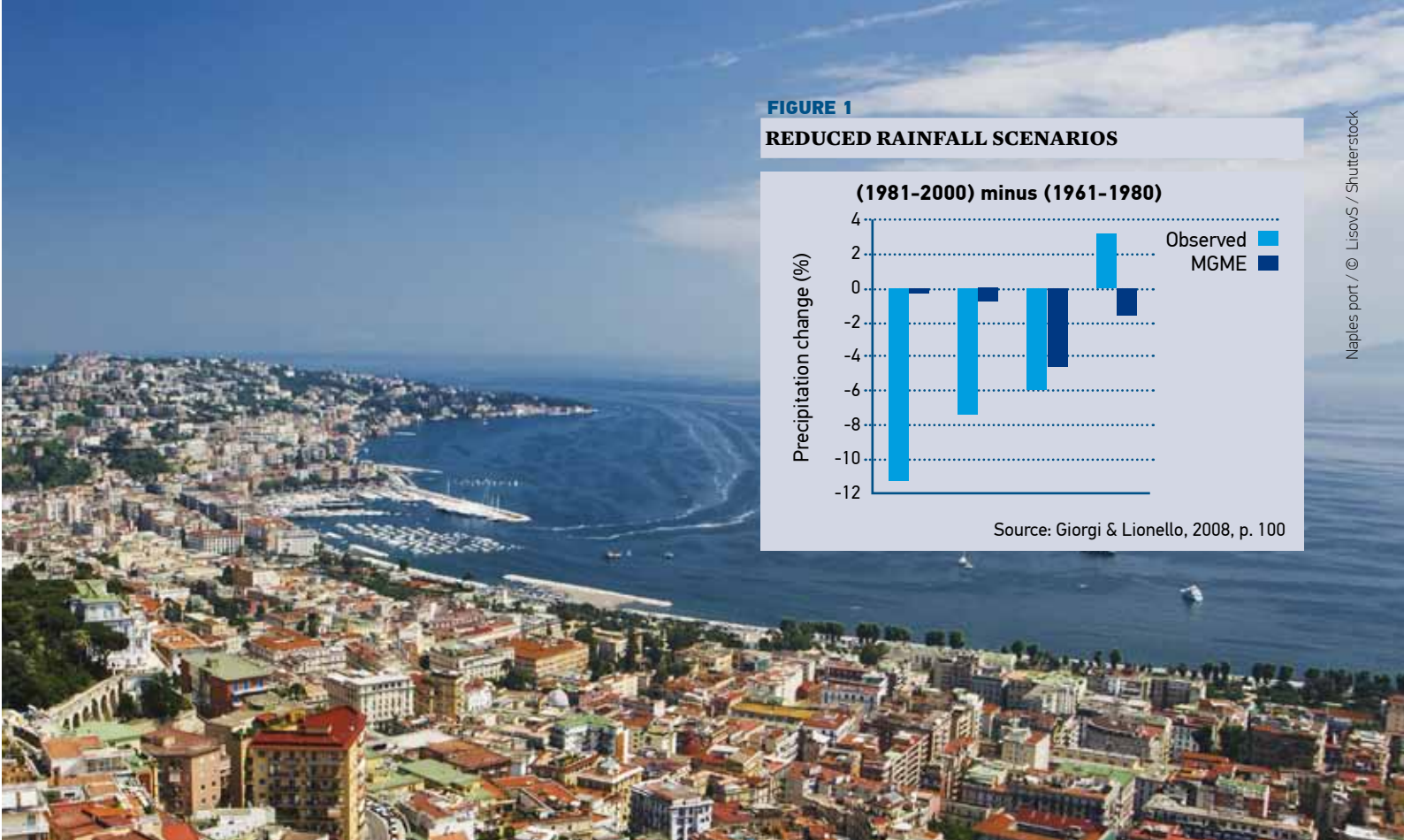
**TABLE 2**  
**A2 SCENARIO FOR CLIMATE CHANGE IN CATALONIA FROM 2070 TO 2100**

	Scenario				Year
	Winter	Spring	Summer	Autumn	
COAST	2,5 / 3,5 -10	3,0 / 4,0 -15	5,0 / 6,5 -40 / -20	3,5 / 5,0 -20 / -5	3,5 / 5,0 -20 / -5
INTERIOR	2,5 / 4,0 +5 / +10	3,5 / 5,0 -15 / -5	6,0 / 7,0 -35 / -15	4,5 / 6,5 -20 / -5	4,0 / 5,5 -15 / -5
PYRENEES	2,5 / 4,0 0 / +15	3,0 / 4,5 -5 / 10	6,5 / 7,5 -25 / 0	5,0 / 6,0 -15 / 0	4,0 / 5,5 -10 / +5
CATALONIA	2,5 / 4,0 -5 / +10	3,0 / 4,5 -10 / 0	5,5 / 7,0 -30 / -10	4,0 / 5,5 -15 / -5	4,0 / 5,5 -15 / -5

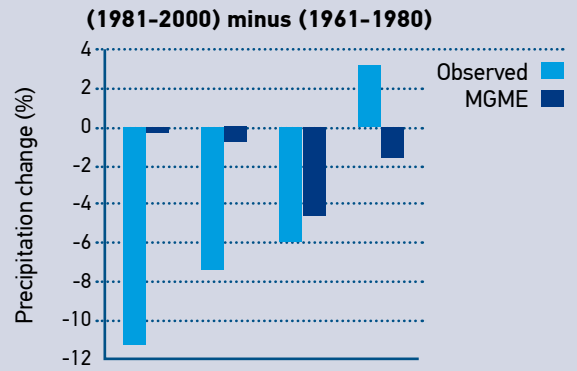
Source: Calbó Angrill, Sánchez-Lorenzo, Cunillera, & Barreda-Escoda, 2010, p. 233

In the Northern Mediterranean, a slight increase in **rainfall** is expected in winter, primarily in the Alps and the Po valley, but in the South the rainfall is forecast to decline. The crucial change will occur in summer, with a minimal rainfall of -25% /-30% throughout the Basin by the end of the century according to the A2 scenario (Giorgi & Lionello, 2008, p. 102; Hertig & Jacobeit, 2008). By the end of the century, minimal of the year will be "very dry" compared to current rainfall patterns (Giorgi & Lionello, 2008, p. 102; Hertig & Jacobeit, 2008).





**FIGURE 1**  
**REDUCED RAINFALL SCENARIOS**



Source: Giorgi & Lionello, 2008, p. 100

As a result of the combination of increased temperatures and reduced rainfall, **the entire region will become extremely arid and, in particular, the northern limit of desertification will advance toward the Northern Mediterranean.** The most affected areas will be the four large peninsulas in the North (the Iberian, Italian, Balkan and Turkish peninsulas), part of Southeast Europe (Romania and Bulgaria) and the large Mediterranean islands (Corsica, Sardinia and Sicily). One of the most dramatic consequences will be the increased risk of forest fires. Obviously, the process of desertification will continue to progress steadily in North Africa and the Levant, regions that are already strongly affected today. The continental climate will disappear almost completely from North Africa and the Levant (for example, in Kabylia and in much of the Moroccan Atlas region, as well as in Lebanon). All this will lead to an extremely high risk of water shortages for agriculture, human consumption and for the natural ecosystems themselves (Gao & Giorgi, 2008, p. 202-208).

The effect on the **marine environment** will be similar. As a result of rising temperatures, there will be an increase in pathogens and biological invasions of other areas, in what is known as the process of “meridionalisation environment” of the Mediterranean Basin ecosystem. Precisely because of its dual attributes, those of being an almost closed sea and also the scene of one of the worst climate change hot spots, the study of the progressive deterioration and impoverishment of the biome we have known until now is considered an **indicator of the future climate of the world’s oceans** (Lejeusne, Chevaldonné, Pergent-Martini, Boudourisque, & Perez, 2010; PNUE-PAM-CAR/ASP, 2008).

The evolution of changes in **sea level** is the most uncertain factor at the moment, despite its obvious relevance in a region such as the Mediterranean, with coasts that have become the most highly attractive sites for establishing urban, population and tourism centres. Much of this scientific uncertainty stems from the fact that the rise in sea level is not only related to thermal expansion of the water mass due to rising temperatures, but also to the increase in the amount of sea water produced by the gradual melting of glaciers and the polar ice caps. Since no consensus exists among climatologists on the rate of this melting, the projections of the IPCC AR4 are extremely moderate: for the entire planet, a rise in sea level of just 19 to 58 cm is expected by the end of the century. As a reference, it should be remembered that the Mediterranean experienced a rise in sea level of between 11 and 13 cm in the 20th century alone. In

fact, many experts believe that an **intermediate scenario is more plausible, whereby sea levels will rise by one metre by 2100** and “tens” of metres over longer time scales (Magnan, Garnaud, Billé, & Gemenne, 2009, pp. 10. -11).

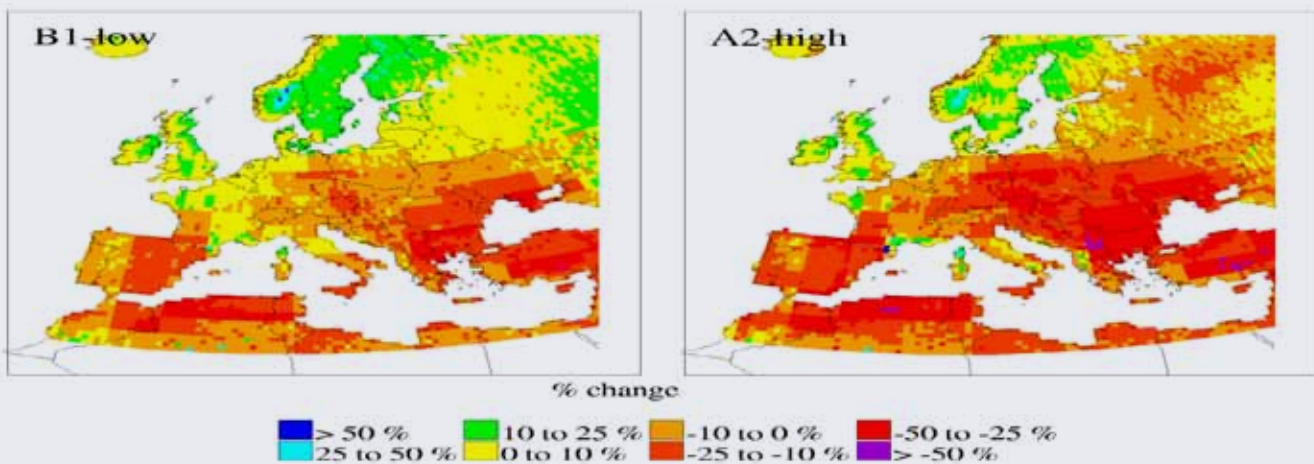
The IPCC AR4 does not give projections for a rise in sea level rise in the Mediterranean and studies specific to the area are scarce. Normally, a rise of up to 25 cm over the course of the 21st century is predicted (Tsimplis, Mark, & Somot, 2008). With the contribution from melting glaciers and the North Pole, and in the A2 scenario, this could reach 30 cm. But more worrying is that the rate of retreat of the Greenland ice sheet is occurring at a much faster rate than expected and neither the IPCC nor the study cited above have evaluated the consequences; thus, they may have underestimated the dire consequences for densely populated areas such as the Nile Delta (Calbó Angrill, Sánchez-Lorenzo, Cunillera, & Barreda-Escoda, 2010, p. 197 and 234).

If to this is added the difficulty of adjusting the projections to the uneven Mediterranean coast, the fact is that the lack of valid studies will do nothing to protect either the network of internationally important tourist resorts or some of the areas containing significant urban agglomerations (such as the tributaries of the Nile, the Rhone or the Po deltas) from the effects of a rise in sea level which may be well above the just over half a metre which was given as the extreme scenario in the IPCC AR4.

Finally, the **threat arising from the combined effects of climate change and natural disasters due to external causes, such as earthquakes, tsunamis and hurricanes** should be mentioned. In particular, as a result of a reasonably well-documented phenomenon found in the Caribbean, there is growing concern about the increase in the temperature of the sea surface, which could lead to an increased intensity, frequency and destructiveness of the so called “medicanes” or Mediterranean hurricanes and to the “intensification of impacts and the formation of future tsunamis in the Mediterranean area due to a rise in sea level “(Buades, 2010a, p. 7; Llasat & Corominas, 2010, p. 275; Magnan, Garnaud, Billé, & Gemenne, 2009, p. 13). Although on a seemingly lower and more diffuse level, the importance which the prevention of global risks in the region has begun to assume is evidenced by the creation in 2009 of an impressive “Programme for Prevention, Preparedness and Response to Natural and Man-Made Disasters” (PPRD), as part of the “Euro-Mediterranean Partnership” which brings together the EU’s coastal states and many of the states in the South and the Levant. Although

**FIGURE 2**

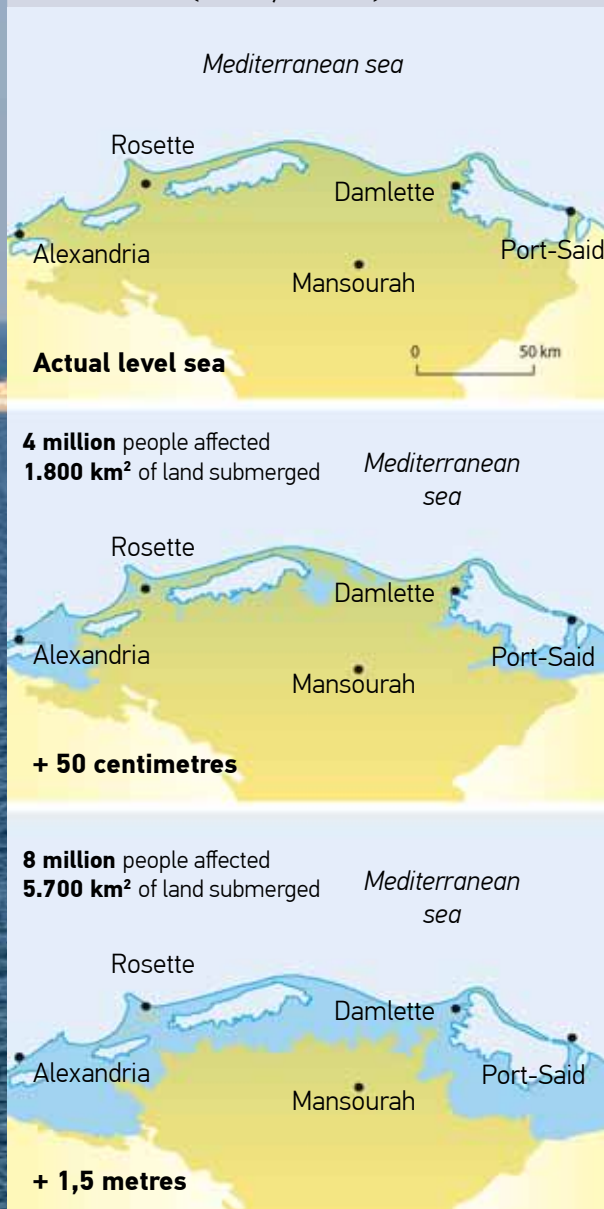
**THE REDUCTION IN RAINFALL BY 2050 [B1 AND A2 SCENARIOS].  
ACADIA PROJECT (EU)**



In both scenarios, the highest levels of reduced rainfall (between -25% and -50%) will affect the Maghreb, Sicily, eastern Spain, Greece and the southern coast of Turkey.

Source: Van Grunderbeek & Tourre, 2008, p. 1/35

**FIGURE 3**  
**IMPACT OF SEA LEVEL RISE ON THE NILE DELTA (UNEP/GRID)**



Source: The sea elevation model has been calculated by Otto Simonet (PNUE/GRID, Arendal and Nairobi) at the beginning of the 1990s. See also <http://blog.mondediplo.net/2008-01-22-Le-delta-du-Nil-menace-per-les-eaux>

in principle the PPRD was conceived as a cooperative support to the poorest regions of the Mediterranean, the fact is that it has produced an excellent modellization of hazards such as tsunamis or earthquakes which is also applicable to the North<sup>1</sup>.

**Regional responsibility for the climate** corresponds roughly to demographic weight: **about 74% of Greenhouse Gases [GHGs] originated in the Mediterranean** in 2007, for a population representing 6.7% of our species. However, the differences between the South and East of the Basin compared to the North are as remarkable as they are for the planet as a whole:

Thus, **two thirds of the emissions** (exactly 66.3% in 2007) were **generated by the Northern**

1. <http://www.euromedcp.eu/en/risks.html>

**TABLE 3****CO2 EMISSIONS IN THE MEDITERRANEAN  
(BY STATES AND TERRITORIES)**

	<b>Tons of CO2 per capita</b>	<b>Total Tons of CO2 (in millions)</b>
Greece	10,1	107.86
Israel	9,8	68.41
Spain	9,5	383.21
Cyprus	9,1	9.54
Libya	8,9	53.88
Slovenia	8,6	17.28
Italy	7,9	460.8
Malta	7,7	3.1
France	6,4	405.06
Croatia	5,6	25.38
Bosnia and Herzegovina	4,1	18.87
Serbia and Montenegro	3,9	39.43
Turkey	3,7	277.2
Lebanon	3,5	13.48
Algeria	3,0	100.95
Syria	2,5	51.03
Egypt	2,1	159.81
Tunisia	2,0	20.26
Albania	1,3	4.65
Morocco	1,3	39.06
Palestine	0,8	3.0
<b>WORLD</b>	<b>4,5</b>	<b>29.914,2</b>

**TABLE 4:****CO2 EMISSIONS IN THE MEDITERRANEAN (BY AREA)**

Northern Mediterranean (10 states)	1465.64	64.4%
Southern Mediterranean (5 states)	373.96	16.4%
Levant (6 states)	436.14	19.1%
<b>Total for the Mediterranean</b>	<b>2.275.38</b>	<b>7.6 %</b> (of the world total)

Source: Compiled by the author from <http://www.guardian.co.uk/environment/data-blog/2009/dec/07/copenhagen-climate-change-summit-carbon-emissions-data-country-world#>

**Mediterranean** (from Spain to Greece, and including Malta). The remainder corresponded to states in the Levant (from Turkey to Israel, in addition to Cyprus), responsible for 19.13%, while the Southern Mediterranean (from Morocco to Egypt) contributed only 14.49%. Practically all states in the North far exceeded the world average per person, except Bosnia and Herzegovina, Serbia and Montenegro and, coming far behind, Albania. In North Africa, only Libya exceeded by far the global average, owing to its oil economy. In the Levant, Israel and Cyprus were the only states that exceeded the global average. To illustrate the inequality of responsibilities, suffice it to say that **Spain's emissions (45 million inhabitants in 2007) exceeded by far those of the whole of North Africa (with 163 million inhabitants).**

### 3. MEANWHILE, THE POPULATION IS EXPLODING AND MIGRATION IS INCREASING

Overall, the dynamic picture drawn by current science regarding the future of the Mediterranean in the short term depicts a Basin which is much hotter than the global average, presenting a degree of change equivalent to that of the last million years, with no major differences between the North, the South and the Levant but with a strong seasonal imbalance and the gradual advance of desertification towards the Northern Mediterranean, giving rise to severe problems as regards water, forest fires and the fertility of agricultural soil. However small the rise in sea level, about which much still remains uncertain, it will nevertheless decisively affect the tourist economy on the coast and could cause large-scale human displacement in highly populated areas near the deltas of important rivers. Whilst regional responsibility for climate is similar to demographic weight across the planet, it is paradoxical that the most vulnerable areas (the Levant and especially North Africa) are those that have contributed least to GHG emissions in the Basin.

Necessarily, the robust predictions made by the scientific community regarding the additional impact which the Mediterranean Basin is beginning to witness and will continue to experience should be seen in the context of expectations for human well-being in the region. We know that **one third of the population in Mediterranean states lives in coastal areas** (UNEP / MAP / BLUE PLAN, 2008, p. 57). A first indicator of the extreme vulnerability of societies in the Basin is what is called the “low elevation coastal zone” (LECZ), i.e., coastal terrain lying less than 10 metres above sea level. Globally, this zone occupies only 2% of the Earth's land surface but holds 10% of the total world population (or 13% of the urban population). Although no systematic studies have been conducted on this issue in the Mediterranean, we do know that Egypt, the most highly populated state in the Mediterranean and with the 16th largest population in the world, is among the 10 states in the world which will be most affected (excluding those with less than 100,000 inhabitants or covering an area of less than 1,000 km<sup>2</sup>). Based on statistics from 2000, no fewer than 38% of Egyptians, more than 25 million people, could be living in these extremely vulnerable areas (McGranahan, Balk, & Anderson, 2007). In total, about 60 million people may be living in coastal areas in the Southern Mediterranean and Levant, and this number could raise to 100 million by 2030. Unfortunately, this region would be the second most vulnerable on the entire planet in terms of natural disasters associated with climate change. As an illustration, the average of three natural disasters per year in the 80's had increased to more than 15 per year in 2006. Of the 276 natural disasters that have occurred in the last 25 years, 120 happened in the last 5 years (World Bank and Marseille Centre for Mediterranean Integration, 2011).

The Basin is also a reflection of humanity's accelerating population explosion, which has been underway across the globe since the Second World War. Thus, if there were 2,550 million people worldwide in 1950, in 1985 there were 4,800 million and forecasts indicate that by 2025, this number will have risen to over 8,000. On a Mediterranean scale, the pattern is similar: the 1950 population of 250 million people had already increased to 360 million in 1985 and is expected to be 600 million by 2025. The Mediterranean is home to more and more people, but

**TABLE 5**

**MEDITERRANEAN STATES BY HDI AND GINI INDEX**

	<b>IDH POSITION</b>	<b>GINI INDEX</b>
France	14	32.7
Israel	15	39.2
Spain	20	34.7
Greece	22	34.3
Italy	23	36.0
Slovenia	29	31.2
Malta	33	s.d.
Cyprus	35	s.d.
Montenegro	49	36.9
Croatia	51	29.0
Libya	53	s.d.
Serbia	60	28.2
Albania	64	33.0
Bosnia and Herzegovina	68	36.3
Tunisia	81	40.8
Turkey	83	41.2
Algeria	84	35.3
Egypt	101	32.1
Syria	111	s.d.
Morocco	114	40.9

Source: United Nations Development Programme, 2011

more importantly, this tremendous increase is marked by a reverse in North-South demographic trends in the Basin: in 1950, two thirds of the population lived in the North; by 2025, no less than 66% of the population will be living in the South and the Levant (La Vanguardia, Dossier, 2005). In other words, **the population is growing dramatically, and especially where climatic deterioration will be most pronounced.** Much of this increase is located in urbanised areas. Thus, the degree of urbanisation in the MENA area (Middle East and North Africa) rose from 48% in 1980 to 60% twenty years later, and is expected to reach 70% by 2015. The pace of urban concentration is one of the highest in the world, exceeded only in the Sub-Sahara, one of the least industrialised regions in the world. As a result, the number of large cities, where vast numbers of people are crowded together in extremely difficult conditions, has multiplied. Prime examples would be Istanbul (more than 13 million inhabitants) and Cairo (over 8 million).

As noted in the case of Mexico, Central America and the Caribbean (Buades, 2010a), it should be borne in mind that **the impact of climate change would also depend**, to a large extent, **on the capacity for social cohesion and welfare shown by different societies.** In any emergency, such as that unleashed by Hurricane Katrina in New Orleans in 2005, the rich and those social classes with access to a public safety net will be better positioned to face the situation. The poor and those levels of society with least access to public health and social protection structures will suffer more and will become innate candidates for a migratory exodus in the most precarious of conditions (Klein, 2007).

One of the indicators revealing the unequal and precarious social situation of many of the states in the South and the Levant compared to the resilience of the North is the United Nations **Human Development Index [HDI]** (which goes beyond per capita income to also assesses the quality of life and social and environmental protection in different societies) and the so-called **Gini Index**. This latter indicator ranks the degree of internal inequality of income distribution in a state on a scale from 0 to 100, where proximity to 0 is the ideal degree of equality among members of a society. Of most relevance here is that the Southern Mediterranean and Levant states (with the exception of Israel, Cyprus and Libya) are ranked towards the middle in the HDI whereas the large Northern Mediterranean states

(France, Spain, Italy) are located in the top quartile of states with a very high level of human development. As for internal social inequality, where data exists, **the Gini index reveals that the worst indicators are for Tunisia, Turkey and Morocco. This is not a negligible finding, considering that together, these states account for about a quarter of the Mediterranean population.**

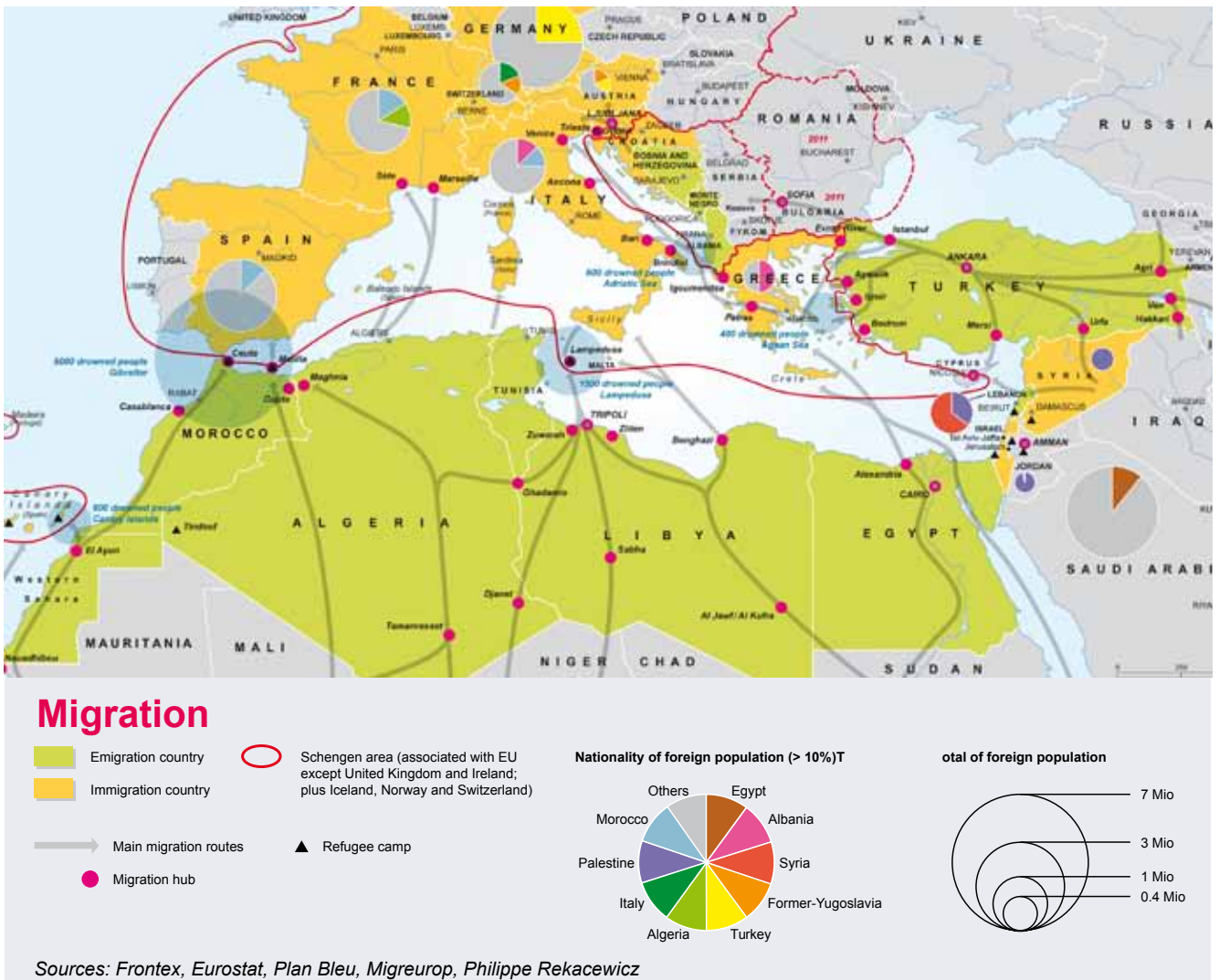
One final aspect to consider as a human risk factor associated with climate change is **geo-strategic security**. The **Mediterranean** is not a minor peripheral region: on the contrary, it represents one of the **most extensive and dangerous security borders between the North and South in the world**, together with the Rio Grande between the U.S.A. and Mexico. As an illustration, between 1994 and 2009, about 5,600 people died on the North American-Mexican border<sup>2</sup>. In the Mediterranean, the trend is much more dramatic: fatalities totalled around 17,800 between 1988 and September 2011<sup>3</sup>. In both instances, these figures are very conservative because they only include documented cases, when it is obvious that there must be many

2.- <http://www.aclu.org/immigrants-rights/us-mexico-border-crossing-deaths-are-humanitarian-crisis-according-report-aclu-and>

3.- <http://fortresseurope.blogspot.com/p/fortezza-europa.html>

more individuals who have simply died in anonymity. Furthermore, almost 400,000 illegal immigrants arriving by land, air and sea were rejected at the gates of the EU in 2010<sup>4</sup>.

**FIGURE 4**  
**ILLEGAL MIGRATION ROUTES INTO THE EU**



Source: <http://www.medsecnet.org>

But most disturbing is that this is **just the tip of the migratory avalanche hastening towards the EU via the Mediterranean**. Not surprisingly, in a report following the Copenhagen climate conference, the prestigious International Organisation for Migration (IOM) warned that **by the middle of the 21st century there could be approximately 1 billion climate refugees around the Earth**. In other words, one in every nine people (IOM, 2009). The key lies in the evolution of the African continent. In 2006, the continent was home to 924 million people: it is expected that by the middle of the 21st century this population may have more than doubled, reaching almost 2 billion inhabitants. Among the eight states whose populations will triple, four (Niger, Malawi, Chad and Guinea Bissau) are part of Sub-Saharan Africa, which is the most vulnerable region on the continent in terms of climate and natural resources such as water and agricultural land. Without a technological, economic and social revolution in the near future, many of these new Africans will have no choice but to migrate north across the Maghreb and the Mediterranean, significantly increasing the risk of military involvement in maintaining security in the Basin. In fact, the EU has long recognised the “immigration problem” as the main threat to its security, evidenced by the existence of its border control agency FRONTEX and by agreements with Gaddafi’s Libya, the Algerian dictatorship and Turkey, a NATO ally since 1952.

4.- [www.lemonde.fr](http://www.lemonde.fr), 21.11.2011.

**FIGURE 5**  
**DEMOGRAPHIC TRENDS IN AFRICA (2006-2050)**

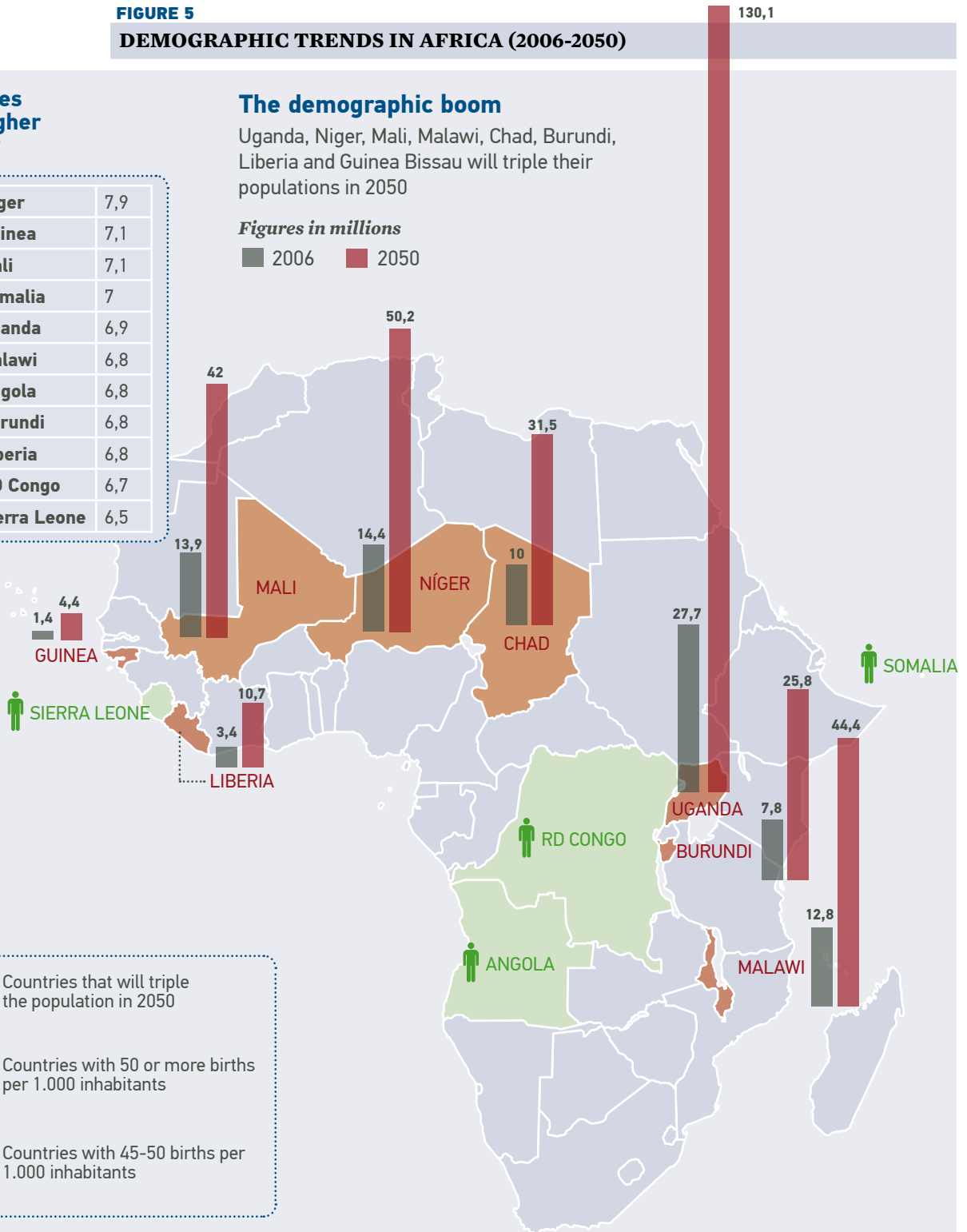
**Countries with higher natality**

1	Níger	7,9
2	Guinea	7,1
3	Mali	7,1
4	Somalia	7
5	Uganda	6,9
6	Malawi	6,8
7	Angola	6,8
8	Burundi	6,8
9	Liberia	6,8
10	RD Congo	6,7
11	Sierra Leone	6,5

**The demographic boom**

Uganda, Niger, Mali, Malawi, Chad, Burundi, Liberia and Guinea Bissau will triple their populations in 2050

Figures in millions  
■ 2006 ■ 2050



Source: La Vanguardia, Dossier, 2007.

In such an unequal and fragile context, it is hardly conceivable that energy initiatives as ambitious as the massive export of solar energy from the Sahara desert to the EU will come to fruition (Desertec), or even that the steady and secure supply of natural gas from Algeria to the North can be maintained, among other reasons because the basic materials will be located in “states on the verge of total collapse” due to social conflicts exacerbated by climate change (Welzer, 2011).





#### 4. THE “SAHARISATION” OF THE MEDITERRANEAN: WHAT WILL HAPPEN TO TOURISM?

If the Mediterranean can be said to have an economic specialisation, it is mass tourism. As is well known, **the Basin hosts about 30% of all international tourism**, receiving around 300 million tourists in 2008, with 100 million more predicted for 2025. 80% of this tourism is based on sun, sand and beach resorts, and the trend is stable. There has been a marked increase since 1970, when the number of tourists received was closer to 60 million.

Although there are important intra-regional differences, the fact is that in accordance with the predictions given in the United Nation’s Blue Plan, the three main regions of the Basin continue to base their plans on the expectation of significant growth (UNEP / MAP / BLUE PLAN, 2008, p. 584; UNWTO, 2011):

- The North (from Spain to Greece, including Cyprus), which saw a 28% increase between 1990 and 2000, may have experience a 52% rise in the number of visitors (domestic and international) by 2025. This region welcomed around 198 million international visitors in 2010, representing 72.5% of the total number of visitors to the Mediterranean.
- The Levant (from Turkey to Palestine) would go from an 88% increase over the period 1990-2000 to 202% by 2025. In 2010, 43 million foreign tourists chose this region as their destination, representing 15.7% of the total for the Basin.
- The South (from Morocco to Egypt) would make a relative leap from 30% growth to 157%. Host to 32 million foreign visitors in 2010, this represented 11.7% of the total for the entire area.

But, as we have seen [Map 1], the region is one of the areas that is most vulnerable to global warming. In view of the credible scientific evidence warning of a “meridionalisation” of the Basin’s climate, it is worth considering the temperatures predicted for the middle of the next century in outbound tourism markets such as those in Central and Northern Europe. Recently, the World Bank published a sensational graph (Figure 6).

It is evident that **the principal states sending tourists to the region, the Central and Northern EU countries, which supply 90% of visitors to the Basin’s beaches, will witness a significant reduction in the desire to travel due to global warming, as they will**

TABLE 6

#### INTERNATIONAL TOURISM IN THE MEDITERRANEAN (2010)

States and territories	Millions of tourists
France	76,8
Spain	52,6
Italy	43,6
Turkey	27,0
Greece	15,0
Egypt	14,0
Croatia	9,3 [2009]
Morocco	9,2
Syria	8,5
Tunisia	6,9
Israel	2,8
Cyprus	2,1
Lebanon	2,1
Algeria	1,9 [2009]
Malta	1,3
Palestine	0,5

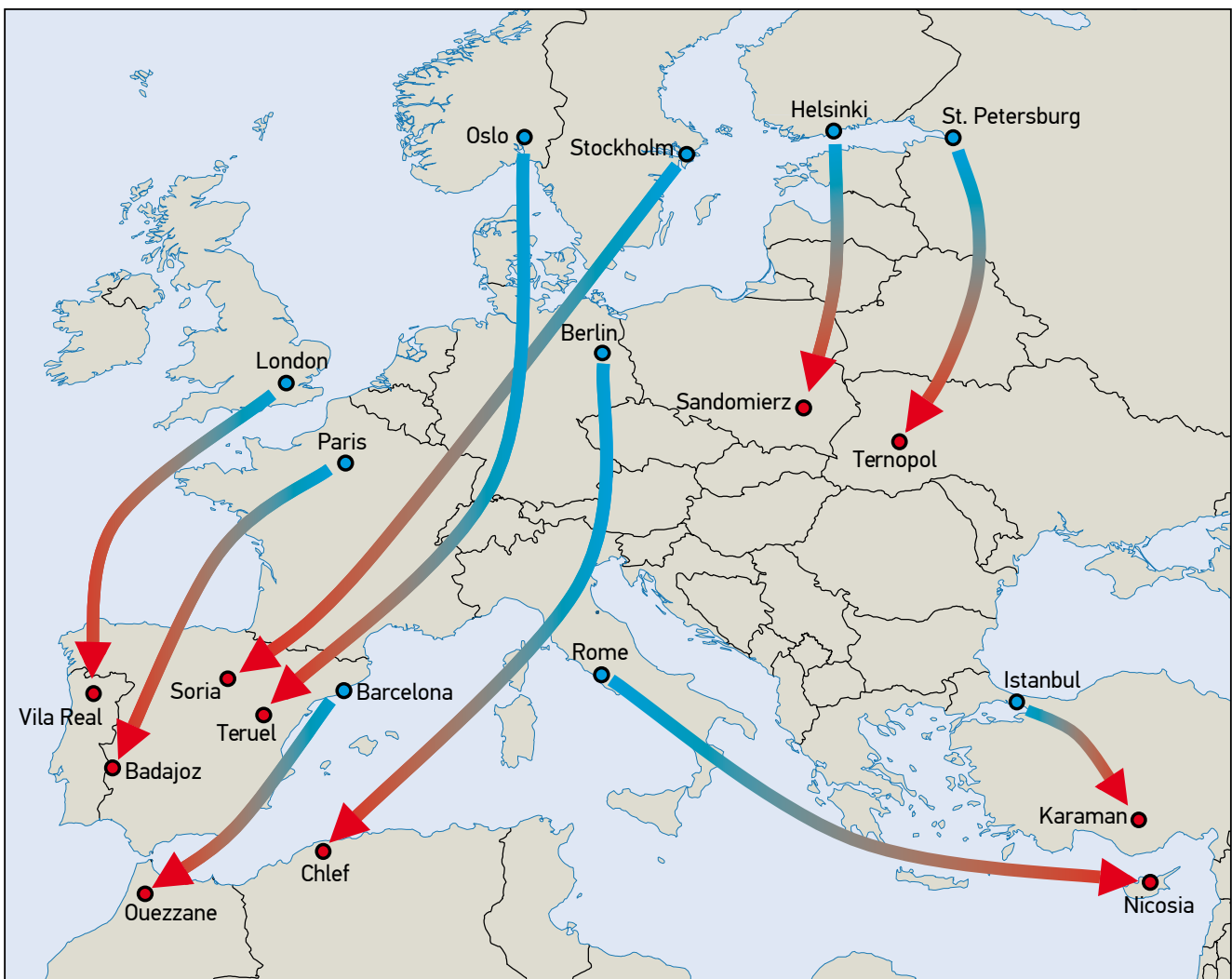
Source: UNWTO

**enjoy neo-Mediterranean temperatures at home.** This change in trends arising from the increasing mildness of the European continental climate collides head-on with expectations of steady rocketing growth in the tourism demand for typical Mediterranean destinations.

This direct threat to the region's stake in tourism should clearly be placed in the context of the **tourism sector's own responsibility for the climate.** Traditionally, the tourism industry (not only hotels, but also transport, food, materials and local services) has been attributed with generating between 4% and 10% of total GHG emissions. The United Nations itself, in a sector-specific study, concluded that tourism held up to 14% of global responsibility (Simpson, Gössling, Scott, Hall, & Gladin, 2008, p. 66). According to the United Nations, in an unsustainable climate scenario (a rise of between +3°C and +5°C in temperature), the tourism sector's share of responsibility would be between 10% and 20% by 2050. If rapid progress were made to ensure a minimum climate scenario (limiting the increase in global temperatures over the same period to +2°C), the impact of tourism would be more than 50%! (UNEP / MAP / BLUE PLAN, 2008, p. 62).

**FIGURE 6**

**EXPECTED TEMPERATURES IN SOME EUROPEAN CITIES BY THE MIDDLE OF THE 21ST CENTURY**



*Note:* With increasing global temperatures, climate zones will shift north, and by the middle of the 21st century many central and northern European cities will “feel” Mediterranean. This is not good news and has major implications: water utilities will need to adjust management plans, and health services will need to be prepared for more extreme heat episodes (similar to the 2003 European heat wave). While a few degrees of warming may seem appealing on a cold winter day in Oslo (the scenario shown in the map corresponds approximately to a global temperature increase of 1.2°C relative to today), the necessary changes in planning, public health management, and urban infrastructure are substantial. Buildings that were designed and engineered for cold harsh winters will need to function in a drier and hotter climate, and heritage buildings may suffer irreparable damages. Even more challenging is the construction of new buildings today as their design needs to be highly flexible to gradually adjust to drastically different conditions over the coming decades.

Source: World Bank, 2010, p. 96

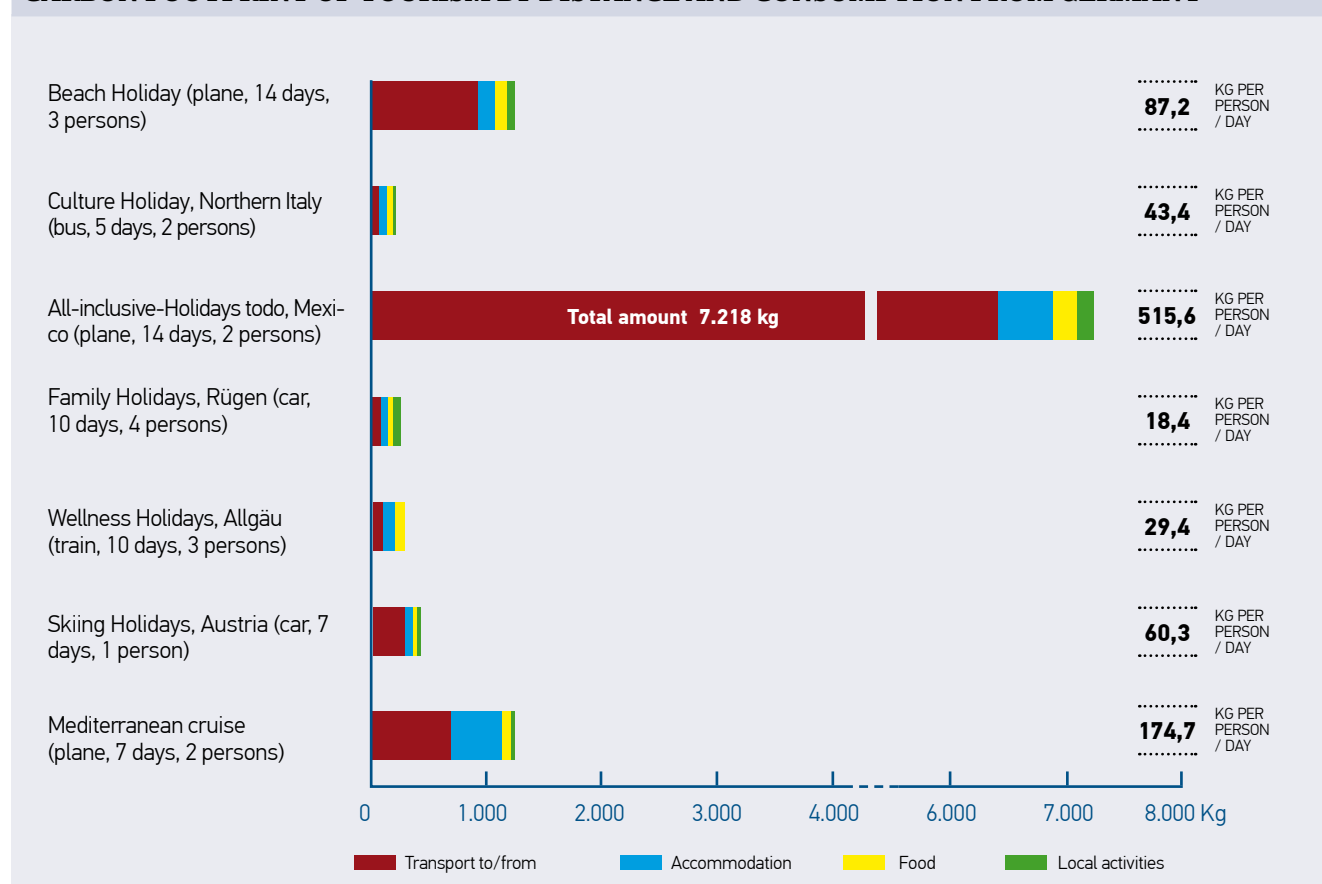
Much of tourism's climate footprint is related to the use of air transport, which generates up to 75% of the sector's emissions. Consequently, depending on the distance between the point of departure and the destination, the climate footprint will differ. Some have calculated the difference in climate responsibility in terms of distance or proximity of the host destinations to Central Europe (figure 7).

The study cited is conclusive and **indicates overseas trips by plane on a "package tour" as being the mode of travel that is most detrimental to the climate.** The second most detrimental is a flight from Central Europe to the Balearic Islands to stay in a beach hotel. The third, to go on a Mediterranean cruise.

Interestingly, in spite of all this evidence concerning the lethal impact of aviation and international shipping on the shared climate, the Kyoto Treaty (1997-2012) exempted both sectors from any reduction target. There is no future in such neglect. The **preservation of the climate will require the correction of an oversight that, given the continuous increase in the volume of global air and sea traffic, merely increases the global threat and accelerates the greenhouse effect** (Buades, 2009a). Recently, both Britain and Germany, the two main outbound tourism markets in the EU, have introduced air taxes levied on the transport of tourists by plane, differentiating between various levels of distance from the airports of departure in order to reflect the climate footprint<sup>5</sup>. Additionally, on January 1st, 2012, the *Emission Trading System* (ETS) entered into force, the new regulatory framework for the carbon market that, for the first time, includes aviation. Thus, in 2012 emissions produced by aviation in European air space should represent a maximum of 97% compared to 2004-2006 and, from 2013, should be below 95%. This is a clear sign that, despite all the legal and environmental flaws, a break is being made with the principle that has existed since the end of World War II

FIGURE 7

**CARBON FOOTPRINT OF TOURISM BY DISTANCE AND CONSUMPTION FROM GERMANY**



Source: WWF Deutschland, 2008

5.- For an overview of what is at stake, read the official British government report on the review of *Air Passenger Duty*: HM Treasury, March 2011. For the German case see: [http://www.bundesfinanzministerium.de/nr\\_103442/EN/Topics/Fiscal-policy/Articles/20100906-Aviation-tax.html?\\_\\_nnn=true](http://www.bundesfinanzministerium.de/nr_103442/EN/Topics/Fiscal-policy/Articles/20100906-Aviation-tax.html?__nnn=true).

of exempting aviation from any tax on the burning of fossil fuels, due to its *strategic* importance.

It is worth noting that in the context of the general and academic cynicism surrounding the increasing threat to the climate, the letal difference in terms of climate footprint between the Caribbean and the Mediterranean has been revisited in an attempt to rekindle the hope that, despite everything, the Western Mediterranean will be the main beneficiary of the end of cheap oil and tax exemptions for international aviation, as in the near future it may find itself absorbing the flow of tourism which previously went to the Caribbean or the Far East and Oceania (Cirer-Costa, 2008) .

The second major limitation to increasing, or even sustaining, current levels of tourism is related to the growing scarcity of water [see Figure 2]. Suffice to say that in 2000, more than one third of the Mediterranean population (35.2%) suffered *water stress*, i.e., had less than 1,000 m<sup>3</sup> per person per year. In all cases, this occurred in states and territories in the South and the Levant:

**TABLE 7**  
**MEDITERRANEAN STATES AND TERRITORIES SUFFERING**  
**WATER STRESS (2000)**

Countries	Water availability per person per year (m <sup>3</sup> )	Population (millions)
Cyprus	992	0,7
Morocco	992	28,5
Egypt	866	66,0
Tunisia	478	9,6
Algeria	470	30,3
Palestine (West Bank)	375	2,0
Israel	274	5,8
Libya	155	6,0
Malta	128	0,4
Palestine (Gaza Strip)	49	1,1
Total affected population		150,4

Source: Buades, 2008

In most of these societies, governments that promoted the massive expansion of tourism (an obvious competitor with the local population for water) have sponsored huge desalination projects that are extremely expensive in economic terms. But more serious still is their lack of climatic sustainability, since most are based on burning colossal amounts of oil to obtain this artificial water, triggering further regional contributions to climate change. The alternative that has tempted some Maghreb dictatorships, such as Morocco, Ben Ali's Tunisia or Gaddafi's Libya, the use of atomic desalination, has no direct climatic effect but nevertheless opens a disturbing era of nuclear proliferation in North Africa which is full of dangers to health and safety (Buades, 2008).

Finally, faced with these new threats that climate change represents for the future of tourism in the Mediterranean, **the question must be raised of whether the advocated reduction in tourism in the region** (especially of tourists transported by air) **would not entail a reduction in the welfare of coastal populations, particularly in the poorest societies, those in**

**the South and the Levant.** In fact, the great promise of tourism since the late 60's, enshrined by the United Nations itself, is that it would be synonymous with a "passport to development." A comparative analysis of the evolution of the growth in tourism in the Mediterranean over almost two decades and its correlation with the most internationally prestigious indicator of community welfare, the United Nations Human Development Index, can be quite instructive:

**TABLE 8**

**DEVELOPMENT OF TOURISM AND THE HDI IN THE MEDITERRANEAN (1990-2008)**

State	Tourists in 1990 (in millions)	Tourists in 2008 (in millions)	HDI Position 1990*	HDI Position 2009	HDI variation 1990-2009
France	52,4	79,2	11	8	+3
Italy	26,6	42,7	19	18	+1
Spain	34,0	57,1	21	15	+6
Greece	8,8	15,9	29	25	+4
Turkey	4,7	24,9	81	79	+2
Syria	0,5	5,4	95	107	-12
Tunisia	3,2	7,0	98	98	0
Egypt	2,4	12,2	119	123	-4
Morocco	4,0	7,8	120	130	-10

\* The United Nations Human Development Index for 1990 included only 130 states, while that for 2009 included 182. Consequently, and in order to compare them, the data for 1990 have been corrected to bring them into line with those for 2009.

Source: Compiled by the authors from <http://www.unwto.org/facts/menu.html>; <http://hdr.undp.org/en/reports/>

What is clear from the table is the lack of correlation between increased numbers of tourists and improved relative welfare of the affected states. Thus, while Spain, with 64% more tourists, rose 6 positions in the HDI ranking in 18 years, Greece, where numbers doubled, only rose 4. Turkey, with six times more visitors, only climbed 2 positions. **If we consider the most impoverished states in the South and the Levant, the lack of any relationship between hosting many more tourists and improved social welfare is evident:** with more than twice as many tourists as 18 years ago, Tunisia continues to occupy the same ranking; with similar enormous growth, Morocco has dropped 10 positions in the HDI; Egypt now has six times the number of tourists but has fallen 4 positions and Syria, with 10 times more tourists in the country, has gone down 12 positions.

Therefore, **the eventual and necessary reduction in the volume of international tourism in the Mediterranean for climatic reasons in no way implies an immediate loss of welfare among its communities.** In fact, the explanation for the gap between a sustained influx of new tourists and the lack of substantial improvements in welfare can be found in what is known academically as "leakage", i.e. the **flow of profits made in one country to others, especially via tax havens.** Regional studies have indicated that the margin of "leakage" for local societies reliant on tourism is **about 75%** (Gößling, Peters, & Scott, 2008; Gößling, Peters, & Scott, 2008). In fact, to a large extent the profits made by the large transnational corporations dominating tourism in the Mediterranean are based on their ability to move money through tax havens rather than on transporting tourists (Buades, 2009b).

#### 4. "HOW DO WE WANT TO LIVE HERE?" (FOR A SHARED MEDITERRANEAN AGENDA ON CLIMATE JUSTICE)

The extreme vulnerability of the Mediterranean to climate change collides with a widespread lack of knowledge and the disinterest of economic and political elites. The global economic crisis, which the financial powers that be have charged to the citizens of European nations through a new neo-liberal offensive against the Welfare State, seems to have overshadowed the visibility and even awareness of the importance of the storm clouds gathering around a climate that has allowed humanity to enjoy mild temperatures for the last 12,000 years.

Furthermore, **the Mediterranean does not constitute a political entity or an area of intercultural cooperation.** On the contrary: a region that is united by environmental conditions and climate is separated institutionally and psychologically between "Fortress Europe" (increasingly barricaded against the "threat" of an invasion of migrants from the South and the East), the Levant in constant turmoil (the eternal conflict in Palestine with an ultra-militarised and racist Israel, the emergence of a new neo-Ottoman imperialism in Turkey and the implosion of dictatorial Arab states) and a South with enormous potential for conflict (population explosion, exploitation by the North of mineral resources, extreme vulnerability to climate change and neighborhood to Sub-Saharan Africa). The Union for the Mediterranean<sup>6</sup>, the only instance of a pan-Mediterranean political relationship, is nothing more than a phantom institution without the capacity for political leadership in its dealings with the EU, the African Union (AU)<sup>7</sup>, Israel, Iran or Turkey. The United Nations' historic and well-meaning "Blue Plan for the Mediterranean"<sup>8</sup> is a merely mechanical institutional network. Therefore, in contrast to the lobbying power of AU states or the AOSIS (Alliance of Small Island States threatened by climate devastation<sup>9</sup>), **this extremely hot region does not have its own negotiators to safeguard its short and medium term future, nor has its future been accorded any significant importance in the ongoing climate negotiations** in Copenhagen, which commenced in December 2009 and should finish by the end of 2012 with the renewal of the Treaty of Kyoto or the signing of a new global treaty on the difficult decades to come.

However, the situation in the Basin is deteriorating: droughts are lasting longer, extreme weather events have become more frequent and migration pressure from neighbouring borders in the South and Levant is ever more intense. As Harald Welzer has said, **we are facing the manifestation of a new global injustice on a historical scale. Climate change is exacerbating economic asymmetries and inequalities in life opportunities between the Northern and Southern Mediterranean.** For all we might not wish to recognise it, the reality is that the extreme inequality of welfare options open to a young North African man (let alone a young woman from Malawi or Niger) compared with a young man from Southern Europe in a time of rapid climate deterioration (with an exploding population, water shortages and no clear alternative livelihood) cannot continue to be ignored for many more years. One consequence of these new grounds for social conflict has been the so-called "Arab Spring" revolts in 2011. Started by chance and unannounced, within a few months they had caused structural setbacks in most of North Africa and the Levant.

6 <http://www.ufmsecretariat.org/en/>

7 <http://www.au.int/en/>

8 <http://www.planbleu.org/indexUK.html>

9 <http://aosis.info/>



In this unique context, which demands new forms of resistance and proposal, the **priority** of social and environmental activists should be **democratic empowerment of proposal Mediterranean societies** in terms of:

- Understanding in detail and in relation to the region as a whole, the nature of the climate scenarios that will have a direct effect, in what might be called a campaign for citizen “climate literacy.”
- Strengthening protective measures for the most vulnerable local communities in the most sensitive areas.
- Creating mutual support networks for social and institutional initiatives in the North and South of the Basin capable of putting projects and emission reduction targets into motion and *greening* consumption, in order to ensure rapid and free technology transfer of clean technologies from the North to the South of the Basin.
- **Practicing Mediterranean citizenship based on the idea of a new global citizenship**, which would enable to be present with a unified voice at global forums where the future climate of the planet is decided (Buades, 2010b).

Following Harald Welzer, and without forgetting that it is urgent we devote every effort to devising and carrying out mitigation proposals (for a significant reduction of greenhouse gas emissions, for example in aviation and tourism) and adaptation plans (to protect the most fragile and vulnerable Mediterranean communities, especially along the coastal strip of North Africa and Egypt), **the vital question should not be “what can we do to stop climate change?” in the region but rather: “How do we want to live here?”** If this question is not addressed first in a novel and creative way by the Mediterranean peoples, the other is of no practical consequence and will remain at the mercy of the technocrats involved in climate negotiations and of elites with no regard for the good of humanity or the Mediterranean itself.

Before it is too late (remembering that the actual turning point cannot be postponed for more than a decade or two), **any progress** towards a viable future climate in the Mediterranean, a region which is experiencing the effects of global warming more than most other regions on the planet, **will necessarily involve** “not only demanding a global culture in favour of a radical reduction in the waste of natural resources but also **promoting a new culture of participation** ... From this standpoint, “climate change” could become the starting point for a fundamental cultural change in which the reduction of waste and violence is not seen as a loss but a gain” (Welzer, 2011).

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# Alba Sud\*

investigación y comunicación para el desarrollo

ALBA is a Catalan association specialising in research and communication for development, founded in Barcelona in 2002. It also maintains a presence and has collaborators in several Latin American countries (Nicaragua, El Salvador, Costa Rica and Mexico). The association basically carries out

research, audiovisual productions and training activities in relation to a series of thematic programmes: Responsible Tourism, Natural Resources and Climate Change, Food Sovereignty, Migration and the World of Work, Communication and Education for Development, Global World.

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Joan Buades (Mallorca, 1963) is a critical researcher in tourism, environment and globalisation. Member of the ALBA SUD research team, he also works with the Research Group on Sustainability and Territory (GIST) at the University of the Balearic Islands (UIB), and with other social organisations. Between 1999 and 2003, he was a representative of the Els Verds (Green Party) in the Balearic Islands Regional Parliament and Councillor for the Environment on the Council of the island of Eivissa. Whilst occupying these posts, he was one of the driving forces for the introduction of ecological taxation on tourism in the Balearic Islands.

His publications include: *On brilla el sol. Turisme a Balears abans del Boom* (Res Pública Edicions, Eivissa, 2004), *Exportando paraísos. La colonización turística del planeta* (La Lucerna, Palma de Mallorca, 2007), *Do not disturb Barceló. Viaje a las entrañas de un imperio turístico* (Icaria Editorial, Barcelona, 2009), *El turismo en el inicio del milenio: una lectura crítica a tres voces* (Forum for Responsible Tourism, Madrid 2012, in collaboration with Ernest Cañada and Jordi Gascón), in addition to numerous articles in national and international publications. He has

also translated into Catalan the works of Vandana Shiva (*“Soil not Oil: Environmental Justice in an Age of Climate Crisis”*, Tres i Quatre and Institut del Territori, València, 2010) and Ernest Callenbach (*“Ecology: a Pocket Guide*, Tres i Quatre, València, 2012).

In collaboration with Alba Sud, he has published several papers in the *Opinions on Development Collection*: *“The Balearic tourism empire, where “the sun never sets”*. Interview with Joan Buades and Macià Blázquez”, March 2009; *“Copenhagen and beyond. Tourism and global climate justice”*, June 2009; *“El legado de Copenhague: La emergencia de una nueva ciudadanía planetaria”*, January 2010; *“Alerta climática, quimera turística y placebo REDD en Centroamérica, México y el Caribe”*, June 2010, and *“Turismo y bien común. De la (i) responsabilidad corporativa a la responsabilidad comunitaria “*, September 2010; *“Geopolítica, neoliberalismo y turismo en los Países Catalanes”*, February 2011.

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