



European  
Research Area

# EUROPEAN POLICY BRIEF



## Climate change, water conflicts and human security in the Mediterranean, Middle East and Sahel

Findings and recommendations from the CLICO FP7 SSH research project ([www.clico.org](http://www.clico.org))

November 2012

### INTRODUCTION

#### Human security: a multi-dimensional concept

Climate change will have an enormous impact on environmental, social and economic conditions. This means that climate change also raises concerns regarding human security. The UN defines human security as a situation where the social, political, environmental and economic conditions conducive to a life in freedom and dignity are present. Human security is multi-faceted and includes freedom from hunger, violence and war, political repression, crime, disease, and environmental hazards. Climate change is more directly linked to some of these dimensions, (e.g. hunger, if agricultural production declines in a region due to drought), and less directly related to others (e.g. crime and political repression). Water and food security are sub-dimensions of human security.

#### Some say: Water scarcity may lead to conflicts – or to cooperation

Climate change may also affect human security by exacerbating violent conflict. Recently, high-level policy documents point to climate change being a risk-multiplier for conflict. The UN Security Council in July 2011 expressed concerns that the possible adverse effects of climate change could, in the long-run, aggravate certain threats to international peace and security. There are studies claiming that water and climate-related conflict may result from scarcity of water resources, a situation that may become more frequent or severe through climate change. However, research also suggests that in many cases, scarcity is an opportunity for cooperation, rather than conflict.

#### Adaptive capacity varies

At the same time, it is clear that countries, communities and individuals are not passive victims of changes to their physical environment, but can adapt to such changes. However, their capacity to do so varies, depending, for example, on the resources, knowledge, institutions and level of income they have. Overall,

vulnerability to climate change depends on the intensity of climatic effects (e.g. how much less or more rain a region receives), people's exposure (e.g. do they live in floodplains), sensitivity (e.g. whether rain-fed agriculture is an important activity in that region), and adaptive capacity (resources, knowledge, etc).

Therefore, climate change does not automatically lead to a worse human security situation or to conflict. Rather, there are complex relationships between political, social, economic, environmental and other factors that, in conjunction with climate change, can either undermine security or trigger/exacerbate conflicts. Under which conditions this happens and what is being and could be done against such developments, is less clear. This was the starting point for the CLICO research project, the results of which this brief presents.

**Mediterranean, Middle East and Sahel – regions vulnerable to climate change**

CLICO has improved our understanding of the key factors and causal chains that may undermine or enhance water-related security in the context of climate change in the Mediterranean, Middle East and Sahel (MMES). This region is likely to see significant changes in water availability due to climate change. Run-off in the Mediterranean region may decrease between 10-30% by 2050, and in some regions of Southern Europe droughts with an intensity of today's 100-year droughts may recur every 10-50 years by the 2070s. Some low-lying areas are also at risk from sea-level rise. For instance, the Nile Delta, one of the most heavily populated and intensely cultivated areas on the planet, is considered by the Intergovernmental Panel on Climate Change (IPCC) to be a hotspot of coastal vulnerability.

The MMES region has a long history of conflict, ranging from conflicts with a regional dimension (e.g. the Arab-Israeli conflict) to conflicts at the local level (e.g. between upstream and downstream farmers in water user associations in Egypt). Moreover, the region comprises countries at various stages of human development, including low-income countries (e.g. Ethiopia with a 2011 per capita GNI of US\$ 400), but also developed nations (e.g. Italy with a 2011 per capita GNI of US\$ 35 330) and consequently varying levels of human security. Thus, the region provides a breadth of socio-economic and political conditions for studying the relationship between climate change, water conflicts and human security.

## KEY OBSERVATIONS

**Climate change is one among many factors affecting human security**

CLICO research supports existing insights that climate change and water-related stresses produce an impact on human security in combination with a range of other social, economic and political factors. For example, a case study on the Sudr region in Sinai/Egypt, where many Bedouins live, finds that factors leading to vulnerability to climate change include the isolation of the Bedouin population, low literacy levels and low awareness of climate change, combined with a sensitive ecosystem and extreme climate variability. However, local knowledge of the ecosystem provides the Bedouin population with a strong capacity to adapt to climate change. Several CLICO case studies on Niger, Turkey and Ethiopia confirm existing insights that social marginalisation (e.g. poverty) can exacerbate vulnerability to climate stresses and human insecurity. In one example, the livelihoods of seasonal migrant workers of Kurdish origin in South-East Turkey are particularly vulnerable to changing weather, but these people have been largely

ignored by the Turkish state in its adaptation policies.

**Climate change is less influential than other factors in causing or exacerbating water-related conflicts**

Climate change in conjunction with other factors is likely to undermine human security, if no adaptation measures are taken. By contrast, the link between climate change and water conflicts is, at most, indirect. For the majority of conflict situations studied in the CLICO project, political, economic and social factors were found to currently be of greater importance than water scarcity or climate-related stresses. However, it is not clear how this balance may change in the future.

An analysis of more than 78 000 newspaper articles on over 10 000 water-related domestic events in 35 countries in the MMES region found that demand-side factors such as population growth, urbanization, and agricultural development have a stronger impact on water conflict than supply-side factors like climate change. Violent water conflicts are extremely rare, and political and economic factors serve to restrain the potential for conflict. More specifically, in countries with a high GDP per capita, the number of violent water conflicts is lower than in countries with lower per capita GDP, although low-intensity disputes may increase with economic development. In less democratic countries, there are considerably fewer water-related conflicts, possibly because authoritarian regimes can make decisions regarding water allocations with less opposition. That being said, violent conflict over water, while rare, was found to be overwhelmingly a phenomenon in authoritarian regimes. Political stability also has a conflict-reducing effect. By contrast, water supply was statistically less relevant in determining if water-related conflict (or cooperation) occurs.

A case study on Sudan and the Nile Basin investigated whether water scarcity was a decisive factor behind international conflicts over water, such as between Sudan and Egypt, and conflicts in certain regions within Sudan (e.g. Darfur). It found political and economic factors such as a lack of effective and accountable state institutions to be more important factors behind existing conflicts than scarcity. The study also highlights that when precisely water is considered to be “scarce” is shaped by social and political circumstances; it argues that such a malleable concept as scarcity is not a factor that could convincingly explain why conflicts over water occur.

**States are important actors in adaptation, but not the only ones**

States play a key role in adaptation, as they can plan and facilitate adaptation by providing the regulatory frameworks that govern adaptation actions by individuals, groups and communities. States may be more capable than individuals or communities of changing wider socio-economic conditions that lead some population groups to be particularly marginalized and thus also vulnerable to climate change. State-led adaptation can also be very useful where population groups cannot themselves adapt. Such a situation exists, for instance in Alexandria, Egypt, which is threatened by sea-level rise and where individuals are “trapped” in unsafe living conditions but have few options to migrate elsewhere.

Still, state-led adaptation is not a silver bullet. One reason is that too much dependence on states can reduce the capacity of communities to adapt autonomously. In some cases, states may respond to the demands for protection by particular groups, shifting costs and risks to others. One example is the Sarno region in Italy, where a mudslide in 1998 killed 160 people after prolonged rainfall. Instead of relocating the few houses built in the Sarno floodplain and severely

damaged by a mudslide, the Italian State opted for engineering an expensive channel to protect the Sarno city floodplain, spending financial resources that could have been used to improve the security of adjacent cities equally exposed to mudslides.

Moreover, and as found in a case study on the Ebro Delta in Spain, sometimes state-led policies fail to address the root causes of vulnerability. In such a situation, both civil society and individuals may attempt to fill this gap and push for human security through informal action. Although welcomed in principle, such activities may raise broader questions regarding the proper relation between individuals and the state, and reflect broader disillusionment with a state that does not perform its duties toward its citizens.

**Climate change adaptation can increase human insecurity and conflict**

It is important to recognize that adaptation may have negative and counterproductive effects (“mal-adaptation”). Adaptation measures do not automatically improve human security for all. CLICO research has identified instances where climate change adaptation has led to a deterioration of the human security of some groups, even if it has increased that of others. One example is found in Niger, where agro-pastoralists have adapted to poor yields from unreliable rainfall by expanding croplands and seeking payment in response to crop damage by grazing animals. These self-adaptations have lessened the adaptive capacity of other population groups in the area, such as pastoralists, who find the area of grazing lands that they have access to diminished and their expenses increased because they have to pay for crop damage by their herds.

Other case studies have highlighted the negative effects of state-led adaptation responses. For instance, in Alexandria, a coastal city in Egypt, state-driven relocation from low-lying coastal lands may reduce direct risks from sea-level rise, such as danger from flooding; however, it may also expose people to new risks associated with displacement and the need to secure sustainable livelihoods in new locations. In Gambella, Ethiopia, certain measures aimed at agricultural modernization and the settlement of rural populations have led to declines in human security for parts of the affected population, at least in the short term. Moving those people out of the flood plain to permanent settlements has decreased their vulnerability to floods, yet at the same time it increases their vulnerability to water scarcity. This is problematic given rainfall in the region is already erratic and likely to become more variable due to climate change. Moreover, displacements have exacerbated existing tensions in the region and resulting in a rise in violence during March and April of 2012.

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**In focus: Cooperative water management in Morocco**

One of the countries studied in CLICO is Morocco. CLICO research identified Morocco as having on average high levels of cooperation over water resources as compared with the rest of the MMES region.

Morocco’s rainfall is uneven in space and time. A high level of attention and effort has been devoted to developing policies and management structures that ensure adequate water supply for public and industrial needs. Rather than being organized along political-administrative lines, the management of Morocco’s water resources is carried out at river basin level, following natural hydrological

boundaries. This approach to water management, also favored by the EU Water Framework Directive, reduces the likelihood that resources will be overexploited, as water allocation is regulated by a single authority with an overview of all sources and users.

Water users participate in management processes from the local level upwards. This participation and involvement means that although there are often tensions (e.g. between different sectors such as agriculture and tourism), agreement between parties must eventually be reached. As a consequence, open conflict is rare. Furthermore, the system prioritizes public over sectoral water supply, thus human security concerns (e.g. water security and health) are placed at the forefront of water management.

While Morocco's approach generally reduces the frequency of water-related conflict, it is not a guarantee for positive outcomes in water management. Increasing drought severity and frequency, coupled with industrial pollution and the growth of Morocco's agricultural exports, mean that demand for water of sufficient quality and quantity is increasing. River basin agencies must therefore continue to engage in dialogue and strategic planning with all sectors to ensure a sustainable future water supply for all Morocco's needs.

## RECOMMENDATIONS FOR POLICY-MAKERS

### Address root causes of vulnerability

Several CLICO case studies have demonstrated that there are often certain root causes underlying the vulnerability of certain countries or population groups and the lack of adaptive capacity of states. Examples include poverty, lack of knowledge and institutions plagued by corruption. Thus, there is a need for addressing these underlying causes in addition to taking measures aimed at adaptation of certain sectors or regions. For example, a case study on the situation of Bedouins in Sinai/Egypt explicitly recommends incorporating poverty alleviation campaigns in adaptation frameworks, since poverty is one of the major obstacles to successful adaptation in the region. The need for better access to reliable environmental data for institutions and the fact that political or scientific uncertainty can prevent effective adaptation has also been highlighted in case studies in Sudan and Egypt. Improved accountability of state institutions, more universal access to justice, less corruption and adequate enforcement of appropriate rules are other requirements for improved adaptive capacity identified in CLICO.

### Strengthening social security systems is an effective way for improving human security

CLICO research also shows how important social security systems are in reducing vulnerability to climate change. Generally, countries with more advanced welfare and social security systems such as those in the North of the Mediterranean are less vulnerable to climate change and better able to cope with climatic extremes than those in the South of the Mediterranean and the Sahel. During good times, investment in civil protection reduces exposure, whereas investment in education and human capital help to enhance the capacity of the population to cope with disasters. Unemployment security helps individuals to cope in times of economic hardship, including where caused by climatic events. In the event of a natural disaster, state-financed social security systems provide the affected people with insurance and health support. States can also subsidise relief, recovery and reconstruction.

Hence, redistribution via the tax system from private wealth to public goods and to the protection of the most vulnerable is a good starting point for policies that aspire to improve human security. Unfortunately, not only this does not seem to be a priority for many developing countries, but there is also a weakening of state social security mechanisms and disaster relief/civil protection institutions within the EU and other developed countries as a result of the economic and public debt crisis. This trend should be stopped.

**Empower affected groups to influence adaptation decisions**

CLICO research has also highlighted the benefits of participatory decision-making. Local knowledge can inform state-led adaptation efforts. For example, adaptation policies for the Sinai region in Egypt could build on local Bedouins' practices for predicting flash floods and managing drought. Equally, where different values, perspectives, cultures and traditions are not taken into account in adaptation there is a risk of tensions and mal-adaptation. States therefore have to establish genuine mechanisms of public consultation and participation to ensure that different preferences and values are incorporated in the design of adaptation policies.

The legitimacy of state-led adaptation can be questioned where the views of state actors fail to consider the priorities of affected populations, as is the case with rural resettlement in Ethiopia, the Bedouins in Egypt or seasonal migrant workers in Turkey. However, involving marginalized social actors in decisions is easier said than done. Often, their exclusion is not accidental, but goes hand in hand with their political and economic marginalization. Without empowering them, their vulnerability to climate change will not be reduced.

**Integrate policies**

CLICO research has shown the importance of an integrated approach towards adaptation. Different actors should cooperate, adaptation should be integrated into existing policies and the potential negative impacts of adaptation measures should be thoroughly considered before they are implemented. As in most other public policies, there is a need to clarify and reduce the overlap of responsibilities by different governmental bodies. There is evidence that climate change adaptation benefits from linking it to existing policy agendas, such as human development and poverty reduction.

**Implementing existing policies could improve human security**

Several countries have useful policies in place, but have failed so far to implement them. This has, for example, been observed for Ethiopia which has adopted quite a lot of adaptation relevant policies relatively recently. However, there is currently a lack of monitoring, compliance and legal enforcement of existing policies in various policy areas which leads to low effectiveness. The same is true for Niger, where the current legislation needs to be more effectively enacted and better communicated to the key rural groups: pastoralists and agro-pastoralists.

**Avoid simplistic explanations on the impact of climate change on conflict**

CLICO research indicates that climate change is likely to play, at most, a secondary role in creating or exacerbating water-related conflicts. Economic and political factors have been shown to be more important in this regard. Consequently, policy discourses should not reiterate simplistic models linking climate change directly to conflict. Emphasis should shift to socio-economic (e.g. economic development and redistribution, social security) and political (e.g. levels

of democracy) factors. Changes in socio-economic and political conditions are more likely to reduce the vulnerability of vulnerable groups, improve human security or make water conflict less likely. Existing and functioning institutions for resolving water-related conflicts and developing water cooperation should be maintained and strengthened.

## RESEARCH PARAMETERS

### Objectives of research

CLICO explores the social dimensions of climate change and in particular the conditions under which hydro-climatic hazards, such as drought or floods, may infringe upon the security of human populations. Exploring this is crucial, because the chain that links climate change to social impacts is long and uncertain, and there is a lack of reliable evidence. The motivation for CLICO is to address this knowledge gap and hence help design better policy responses. The project focuses on the geographical areas of the Mediterranean, Middle East and the Sahel, and on water-related stresses such as droughts, floods and sea-level rise, which are expected to intensify with climate change. More concretely, the project pursues the following objectives:

- (i) To understand relationships between hydro-climatic hazards, climate change vulnerability, human security and conflict, through theoretically-informed, comparative, empirical, quantitative and qualitative social science research.
- (ii) To map international and national policies for security and adaptation in water resources and hazard management, and develop policy priorities as regards hydro-climatic hazards (“hydro-security”) in the region, applicable to the UN, EU and national states.

### Scientific approach/ methodology

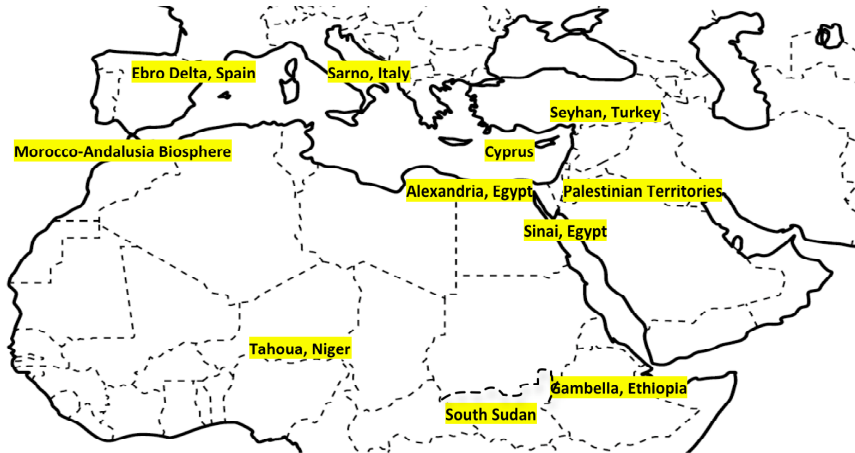
CLICO’s scientific approach is structured around one theoretical-conceptual and four empirical blocks of research, which are:

- A conceptual framework developed at the initial stage of the project and updated at its end on the basis of project empirical findings.
- In-depth case studies on the links between climate change and human security in 11 climate change hotspots (see map below).
- A statistical study of factors explaining domestic water related conflict and cooperation in 35 countries for the time period of 1997-2009, taking account more than 10 000 water-related events.
- An inventory of international and national policies dealing with water resource management, and responses to climate change, security, hydrological hazards and disasters.
- An appraisal of transboundary policies, including an evaluation of the adaptive capacity of institutions in the 42 shared, international basins of the study area, and an assessment of ways in which climatic uncertainties are tackled in international water treaties.

Project findings are synthesized in an ‘Assessment and Policy Guidelines’ report that brings together theoretical and policy-relevant results of the project in a single, coherent document accessible to policy-makers, media and the public.

CLICO formed part of the CLIWASEC research cluster ([www.cliwasec.eu](http://www.cliwasec.eu)), which besides CLICO, included the CLIMB and WASSERMed projects. It assessed the manifold consequences and uncertainties of climate implications on man-environment systems.

**Map: CLICO case study sites**



**Further reading**

Bernauer, T., T. Böhmelt, H. Buhaug, N.P. Gleditsch, T. Tribaldos, E.B. Weibust, and G. Wischnath (2012): Water-Related Intrastate Conflict and Cooperation (WARICC): A New Event Dataset. *International Interactions* 38, 529-545

Goulden, M., Grainger, S. (2012) Integrated theory of hydro-climatic security, CLICO Working Paper 13, available at : <http://www.clico.org/working-papers>

McGlade, K., and Turcotte, I. (2012) Effectiveness of Current Policy Frameworks in Mitigating Climate-induced Risks Relating to Human Security and Conflict. Case Study on Morocco. (Berlin: Ecologic Institute), available at: <http://www.ecologic.eu/7221>

Tribaldos T., (2012) Conflict and Cooperation over Domestic Water Resources: Case Study on Morocco. CLICO Working Paper 10, available at: <http://www.clico.org/working-papers>



## PROJECT IDENTITY

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<b>Consortium</b>	<ul style="list-style-type: none"> <li>• The School of Development Studies and Tyndall Centre for Climate Change Research, University of East Anglia (UEA), UK (<a href="http://www.tyndall.ac.uk/index.html">http://www.tyndall.ac.uk/index.html</a>)</li> <li>• Ecologic Institute, Germany (<a href="http://www.ecologic.eu">www.ecologic.eu</a>)</li> <li>• Centre for the Study of Civil War, International Peace Research Institute (PRIO), Norway (<a href="http://www.prio.no">www.prio.no</a>)</li> <li>• Hebrew University of Jerusalem (HUJ), Israel (<a href="http://www.huji.ac.il/huji/eng">www.huji.ac.il/huji/eng</a>)</li> <li>• ETHZ Zürich, Center for Comparative and International Studies, Switzerland (<a href="http://www.cis.ethz.ch">www.cis.ethz.ch</a>)</li> <li>• The Cyprus Research and Educational Foundation (Cyl), Cyprus (<a href="http://www.cyi.ac.cy/">http://www.cyi.ac.cy/</a>)</li> <li>• School of Global Studies, University of Sussex (UOS), UK (<a href="http://www.sussex.ac.uk/global/">http://www.sussex.ac.uk/global/</a>)</li> <li>• United Nations University, Institute for Environmental and Human Security (UNU-EHS), Germany (<a href="http://www.ehs.unu.edu/">http://www.ehs.unu.edu/</a>)</li> <li>• Palestinian Hydrology Group for Water and Environmental Resources Development (PHG), Palestinian Territories (<a href="http://www.phg.org/">http://www.phg.org/</a>)</li> <li>• Centre for Ecological Research and Forestry Applications (CREAF), Spain (<a href="http://www.creaf.cat/eng/index.htm">http://www.creaf.cat/eng/index.htm</a>)</li> <li>• The Israeli-Palestinian Science Organization (IPSO), Israel/Belgium (<a href="http://www.ipso-jerusalem.org/">http://www.ipso-jerusalem.org/</a>)</li> <li>• Department of Political Science &amp; International Relations (PSIR), Addis Ababa University (AAU), Ethiopia (<a href="http://www.aau.edu.et/index.php/political-science-overview">http://www.aau.edu.et/index.php/political-science-overview</a>)</li> </ul>
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<b>Website</b>	CLICO working papers and other publications are available at: <a href="http://www.clico.org">www.clico.org</a> .
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