Policy frameworks to address climate-induced risks to human security and conflict - recommendations

Contract number: SSH-CT-2010-244443

Work Package: 4.3

Deliverable number:

Partner responsible: Ecologic Institute

Deliverable author(s): Christiane Gerstetter, Rodrigo Vidaurre, Elizbeth Tedsen, Katriona McGlade, Lucy Smith

Planned delivery date:

Actual delivery date:

Dissemination level: Public

Abstract

This paper summarises different policy approaches for addressing hydroclimatic hazards and their impacts on human security and conflict. It identifies pertinent policy examples based on research carried out in the Mediterranean, Middle East and Sahel (MMES) region and provides concrete recommendations for policy makers and donors at national, EU and international level.

This research is funded by the European Commission's Seventh Framework Programme (FP7/ 2007-2013)
Co-operation Theme in Socio-Economic Sciences and the Humanities

Table of contents

1. Introduction

The Mediterranean, Middle East and Sahel (MMES) region is a climate change "hot spot" that is expected to experience large climatic changes. Predicted impacts include raises in temperature, changes in seasons and precipitation patterns, sea-level rise, and increased frequency of extreme weather events such as drought or floods. Human insecurity is a reality which many people in the region live in already at present – a situation that may even become worse with the onset of climate change.[i] Warnings have been voiced that as natural resources become scarcer, new conflicts may arise in the region.[ii] Indeed, climate change, human security and conflict seem to be linked in complex ways (see box).

Links between climate change, human security and conflict – evidence from case studies

This box presents evidence gathered, through case studies in Ethiopia, Morocco, Palestine and Israel,[iii] on how climate-induced changes in water availability, human security and conflict, as well as policies, are related. Similar trajectories have been identified by other researchers in different settings.[iv] Nonetheless, this list is inconclusive, in that in other regions of the world, additional links and trajectories may be at work.

Existing human insecurity - climate change - lack of adaptive capacity/policy response - increased human insecurity

Poverty and human security are often deeply intertwined, whether related to or independent of environmental factors. Persons experiencing poverty, and conceivably related food, health and other insecurities, have considerably greater vulnerability to adverse climate impacts and water scarcity and also have less adaptive capacity or ability to mitigate threats. Financial capacities generally constrain adaptation responses for both individuals and states; insufficient financial capacity can leave developing countries unable to implement and manage adaptation measures, and make them dependent on external funding. Costly adaptation methods may be out of reach for communities without financial means. "It is an issue of development, if you are developed, you have the capacity – whatever happens you can manage," said one Ethiopian interviewee.[v] Thus, the human security of such "insecure" people is more likely to be negatively affected by climate change than those of people who already live in a more "secure" situation.

Related, when development needs are pressing, more immediate social concerns are often higher on the agenda than climate change and may be seen isolated from environmental risks. This may lead to an absence of adaptation-related action by individuals or communities. As one interviewee in Morocco noted: "When you are in a developing country, social problems can be much more important and need immediate attention compared to the question of climate change."[vi]

With regard to conflict, a similar picture can be drawn. Climate and water-related human security and conflict risks were perceived by interviewees in case studies to be closely intertwined, as a lack of human security may drive conflict. Interviewees supposed that the loss of livelihoods, socioeconomic conditions, poor health and food insecurity all reduce stability, which can in turn give rise to conflict tensions.

Existing conflict - climate change - increased/prolonged conflict

In some cases existing conflicts could become more intense as resources become scarcer over climate change. For example, in Ethiopia, there are long-standing intermittent conflicts over water and natural resources amongst different pastoral groups: These date back several centuries and tend to be more frequent in periods of drought, even if there is always a complex set of causal factors behind these conflicts. An interviewee in Ethiopia described how resource-related conflict was intensifying. "Conflict in pastoral areas has been there, but when resources availability was better, the systems worked better, the one group would host the other group and so on."[vii]

Existing conflict - climate change - lack of policy response - increased human insecurity/conflict

Existing conflicts also may have negative impacts on policy responses that could address climate-induced risks to human security and conflict**,** which in turn influences human security and conflict. The case of Israel and Palestine illustrates this dynamic and prior mistrust between parties decreases the potential for cooperation over water and the implementation of policies.

Existing policies - human insecurity/conflict - climate change - human (in)security

Existing policies unrelated to climate change were also considered to influence human security under conditions of climate change in that they led to improving or exacerbating the human security of parts of the population irrespective of climate change.[viii] For example, a few interviewees felt that Ethiopia's development policy may, indirectly, result in stresses to water resources and related threats to human security. As part of the government's comprehensive strategy to increase development, policymakers are pushing commercialization of agriculture, including support for foreign investors and large-scale land leasing programs. Although these policies are premised on supporting food security and development, some feel that they reduce land and water availability for pastoralist communities. Ethiopia, conflicts over resources were also seen to be stemming indirectly from certain government policies. Interviewees identified large-scale agricultural development programmes that often involve voluntary resettlement of communities as a relatively recent source of conflict. In some instances, however, existing policies also played a more positive role. For example, an Ethiopian interviewee described how development programs encouraging voluntary settlement and shifts in agriculture-based livelihoods could reduce resource-based conflict and create stability.[ix] Also, because the case study countries have already experienced climatic variability and water scarcity in the past, institutions and policies are already in place for responding to drought conditions in Israel, Morocco and Ethiopia unrelated to climate change. These can and are used or form a basis for addressing climate change impacts.

In any event, it is clear that whether or not climate change undermines human security and/or creates conflict or cooperation resources depends – amongst other factors – on the institutions in place and policies adopted to counter the effects of climate change. This briefing paper provides insights and recommendations on the policies and institutions needed to address water-related risks to human security as well as to prevent or reduce potential conflicts over water that may be caused or exacerbated by climate change.

Definition of terms

Human security was famously defined by UNDP in 1994 in the following way: "Human security can be said to have two main aspects. It means, first, safety from such chronic threats as hunger, disease and repression. And second, it means protection from sudden and hurtful disruptions in the patterns of daily life – whether in homes, in jobs or in communities. Such threats can exist at all levels of national income and development."[x] Human security has sub-dimensions such as water security and food security that can be defined as a situation where an individual consistently has access to water/food in a sufficient quality and quantity.

Climate **change adaptation** refers to a "process, action or outcome in a system (household, community, group, sector, region, country) through which the system better copes with, manages or adjusts to changing condition, stress, hazard, risk or opportunity associated with climate change"[xi] By contrast **maladaptation** can be defined as "action taken ostensibly to avoid or reduce vulnerability to climate change that impacts adversely on, or increases the vulnerability of other systems, sectors or social groups"[xii]

The terms **adaptive capacity** and resilience are closely linked**. Adaptive capacity** "the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences".[xiii] **Resilience** can be defined as the "amount of disturbance a system can absorb and still bounce back to a reference state; the degree to which the system is capable of self-organisation; and the degree to which the system can build and increase the capacity for learning and adaptation"[xiv] Thus, both terms are very similar in meaning, and sometimes used interchangeably.[xv]

The text is primarily addressed at policy-makers within individual MMES countries as well as at EU level. It is based on an analysis of existing policy frameworks in several countries of the MMES region as well as more than 70 interviews with policy-makers and experts in the region as well as the EU and UN level.[xvi] On the basis of these case studies and existing literature we have also identified policies that seem to be effective in tackling climate-induced human security and conflict risks, related to water. The examples selected are all policies that rather specifically address water-related climate change impacts or water management in a given context and at the same time are, in principle, transferable to a different context. These policy examples are described in boxes throughout the text and should give decision-makers and stakeholders in different countries on possible measures to adopt in their specific local context.

The text is structured as follows. In section 2 we provide a general typology of policy approaches to adaptation. In section 3 we discuss specific approaches to adaptation: section 3.1 outlines policies and approaches in different areas whilst section 3.2 summarises the 'mainstreaming' of climate change adaptation as an overarching approach. In section 4 we summarise our overall insights on policy frameworks for adapting to climate-induced impacts on water, human security and conflict. Our concrete recommendations are directed at policy-makers at the national and EU level, as well as donors and actors at international level. These are presented in section 5.

2. Policy approaches towards adaptation

There is a wide range of policies that support adaptation efforts, and are thus likely to improve human security and prevent/reduce conflicts in the light of climate change. Not all of them come under the title of adaptation. Broadly speaking, the following different types of policies can be identified:[xvii]

Policies targeted at enhancing the overall adaptive capacity of the population and natural resources: Research on adaptation to climate change shows that even where the physical impacts of climate change are identical in two regions, the impacts on people, the economy and the natural resources vary, depending on the capacity of people and institutions to adapt to changing circumstance. Thus, one way in which policies can contribute to successful adaptation is by enhancing the overall capacity of people to adapt to climatic changes. This, in turn, makes it easier for people to cope and adapt themselves and autonomously to changes in their external environment. Generally, poorer people tend to be more vulnerable to climate change; thus, measures that improve the socio-economic status of poorer people are often also good for adaption to climate change. Examples are income-generation schemes, insurance schemes for climatic risks such as drought or floods, or broader social security schemes. Box # describes the Turkish insurance scheme for agricultural risks, a specific policy measure that could also be applied in other contexts.

Similarly, if one assumes that people would fight over natural resources as they become scarcer, measures that improve the socio-economic situation of people or entire countries could be a counter-measure; with enough financial means available, existing resources can be conserved better, substituted, be imported from elsewhere, or even artificially generated (e.g. water through desalination). Finally, it is not only resilient people that will more easily adapt, natural resources that are in a better shape will also be less vulnerable to the impact of climate change. Thus, for example conservation measures may also be an effective adaptation measures.

Policy example: Insurance schemes for farmers

One specific measure for mitigating the impact of climate change for farmers can be insurance or compensation schemes that cover climate-related risks, notably drought.[xviii] Some countries in the MMES region where such schemes exist are Turkey, Morocco[xix], and Spain.

In Turkey, a state- supported agricultural insurance scheme was first introduced in 2005 with the "Law on Agricultural Insurance"(no: 5363). The law establishes a non-profit enterprise (Agricultural Insurance Pool Enterprise, TARSIM) with 23 insurance companies as partners and is linked to the Ministry of Agriculture and Rural Affairs and State Treasury. TARSIM offers 5 types of insurance policies, namely crop insurance, greenhouse insurance, livestock life insurance, water products insurance and poultry insurance. All the risks and products covered are decided upon by the Council of Ministers, and tariffs for annual premiums are proposed to this body by the Ministry of Agriculture and Rural Affairs and the TARSIM board. Since its initiation in 2006, TARSIM has offered agricultural insurance with a 50% subsidy from the government regardless of the region, crop or risk type. The insurance scheme cover risks like hail, storm, fire, cyclone, landslide, earthquake and, most important, in the context of climate change floods and flash floods. However,

the scheme does not cover drought: this is problematic as more and heavier droughts are a likely impact of climate change in Turkey.

A recent sharp increase in the number of insurance contracts concluded with agricultural producers indicates that this insurance scheme is an innovative and useful policy tool to enhance human security and well-being of agriculture dependent communities in the face of climate change.[xx]

Policy example: Water user associations

There is evidence that strong social networks facilitate adaptation[xxi]. The first reason is that they allow for communication; people can thus exchange knowledge about risks and possibilities of addressing them and take collective decision on how to deal with them. Moreover, where closer social relationships exist, people tend to help each others in times of stress, again making it likelier that people can protect themselves against changes in their natural environment. Thus, creating institutions that create and strengthen such links can be a good adaptation option; research shows that community-based management of natural resources is often beneficial for climate change adaptation.

Water user associations are one example. A water user association (WUA) is a co-operative association of individual water users who undertake water-related activities for their mutual benefit. Such activities could e.g. be water allocation to the members and maintenance of infrastructure. Equally, conflict resolution mechanism can be part of the tasks of a water user association. Essentially, water user associations are a form of managing water as commons or common-pool resources. Thus, WUAs are not only relevant in climate change adaptation, because they allow for collective actions of their members and mutual support, but also because they allow for environmentally sustainable water management.

One example of the beneficial impact of WUAs is Egypt. In Egypt, water has historically been a contested scarce resource. As a result of climate change impacts, it is expected that water will become even scarcer and its use more contentious. Past conflicts, which mostly occurred when farmers at the head of irrigation canals extracted water at the expense of farmers at the end of the canal, resulted in the exchange of harsh words, fist fights, and even murder in some cases. In 1995, WUAs were created as part of the Irrigation Improvement Programme (IIP). WUAs are voluntary organizations, made up of representatives of a district, selected by all community members. In a WUA, a group of farmers jointly allocates, distributes, and manages their common source of water. The IIP has reduced the number of disputes and conflicts over water and the WUAs have become a prominent factor in saving water.[xxii]

It should be noticed that obviously such positive effects are only likely to occur if the WUAs actually are living institutions that function and thrive in reality; by contrast, the mere existence on paper of such institutions is not enough. Similarly, there are also examples from other countries of WUAs that do not function effectively; WUAs thus are no silver bullet solution for adaptation – they need to be living and thriving communities to contribute to successful adaptation.

Measures aimed at improving institutions and governance: Generally, the way that institutions work is also likely to influence whether effective adaptation policies are adopted and implemented in a given country. For example, institutions that are characterized by a high degree of corruption are likely to be less effective in tackling climate change adaptation.[xxiii] A lack of participation of those at which adaptation policies are addressed or who are affected by it may lead to a situation where the respective measures are not accepted and thus cannot be implemented. A lack of planning capacity and a failure to take account of scientific insights on climate change impact for policy-making may lead to measures that do not address the main risks or target the most vulnerable people. Thus, measures aimed at broadly improving institutions and governance processes in a given country, region or community will frequently also be beneficial for climate change adaptation, and in turn human security. Moreover, where institutions or mechanisms are in place to solve differences of interests, conflicts are less likely to arise or intensify than where they do not exist. The box below on "Water conflict resolution with a tradition" describes such an institution.

Policy example: Water conflict resolution with a tradition – the Water Court of the Valley of Valencia[xxiv]

The *Tribunal de las Aguas de la Vega de Valencia* (The Water Court of the Valley of Valencia, Spain) was created over 1000 years ago by farmers to solve water disputes within the region. Today, the Court continues to carry out this longstanding tradition on a weekly basis. Eight judges, locally elected by farmers, gather in a circle at one of the city's central squares to settle disputes brought before them by farmers along the Turia River and the Orchard of Valencia. The court is known for making efficient and swift decisions but in rare cases witnesses may be called to testify and land can be inspected by the judges.

Several facts make the Water Court unique. Firstly, no records or minutes of court proceedings are taken and the entire hearing is made orally with no paperwork involved. The judges who serve on the council are not imposed by a higher authority but are local townsmen from Valencia who are democratically elected. These judges are not legal professionals but have an extensive grasp of the laws that must be applied in this context and can thus take rapid, informed decisions. Despite the fact that the proceedings are particularly casual, conversational in nature, and performed in view of the public, the decisions of the Court are legally binding and formally recognised by Spanish law. The Court itself is even mentioned in the Spanish constitution. Moreover, decisions taken by the Court cannot be taken to a higher court for appeal and thus deliver a final and non-negotiable verdict.

The longevity and efficiency (both in time and financial costs saved) of the Water Court proves its value for countries and regions that frequently experience conflicts or disputes over water and thus seek a local, personal and efficient problem solving mechanism.

A sitting of the Water Court in Valencia, 27 November 2010, Source: http://commons.wikimedia.org/wiki/File:Valencia_Water_Court.JPG

Adaptation-specific measures: While the first two categories relate to measures that bring important benefits for climate change adaptation, but are not specifically targeted at it, another option to address human security and conflict risks resulting from climate change are also specific adaptation measures. One approach in this regard is mainstreaming climate change adaptation into different policy areas and thus treating climate change as a cross-cutting issue to be dealt with by all relevant policy actors, government departments, etc. (see section 3.2 for a discussion on mainstreaming). The other one is taking specific measures to counter the effects of climate change in a certain policy area or location (see section 3.1 for a review of measures in specific policy areas). Such measures can notably be aimed at reducing a system's vulnerability (e.g. by building flood protection) or at altering exposure to risk (e.g. through early warning systems).[xxv] Generally, sectors depending on natural resources such as water or land are likely to be hit hardest by climate change; agriculture is one important example. Countries where economic activities are concentrated in these sectors are likely to suffer the most severe economic consequences. Thus, policies aimed at achieving either general improvements in the respective policy areas (e.g. sounder water management) or specific objectives relating to climate change (e.g. crop changes in response to changing climatic patterns) are likely to be beneficial in terms of climate change adaptation, and hence human security. Adaptation measures can also target more than one policy

area at a time, e.g. a measure aimed at improving water use efficiency in the tourism sector is of relevance for both the water and the tourism sector.

Neither mainstreaming nor area-specific measures are necessarily better or worse, and in fact they will often be complementary. In the following section, we will discuss both approaches and their respective advantages as well as overarching criteria that such measures should fulfill.

Policy example: Early warning and forecasting systems

Early warning systems are a key instrument for reducing flood risks, providing sufficient time to evacuate and protect property. Early flood warnings and forecasts of flooding risks are critical to prevent or reduce damage and have been shown to effectively reduce disaster-related fatalities.[xxvi] Early warning systems can also be used for climate-related drought events and disease outbreaks.[xxvii] Effective early-warning and forecasting systems should be supported by meteorological information and the earliest possible warning of extreme weather conditions, using meteorological data such as precipitation and temperatures as input for hydrological forecasting models.[xxviii] Climate forecasting can also improve preparedness and management decisions in agricultural production, thereby leading to higher resilience against climatic variability. In 1982, Mali's national meteorological service, the Direction Nationale de la Météorologie, began supplying local farmers with forecast information to help with climate risk management, a programme that has since grown substantially and successfully helped more than 2,500 farmers with management decisions, enabling higher yields and greater risks and investments.[xxix] The program's success is attributed to factors including a community-level focus, communication that includes and use of a multi-sectoral working group. Forecasts reached farmers through radio broadcasting in local languages, avoiding literacy barriers.

Flooding of Oued Flifla in El Jadida, Morocco February 1996. Author: L. Mahin, http://commons.wikimedia.org/wiki/File:Gross%C3%A8s_aiwes_El_Djadida_1996_oto.jpg

3. Specific approaches to adaptation

In this section we discuss policy approaches specifically targeted a climate change adaptation in policy areas which are likely to witness serious water-related impacts of climate change (3.1) and mainstreaming adaptation.

3.1. Relevant policy areas and measures

Climate change is a cross-cutting issue, and policies which have to potential to improve human security and reduce conflict are designed and implemented within a range of policy areas. Many adaptation measures are cross-cutting by nature as well; for example, irrigation measures cover both agriculture and water management. Policy areas having particular relevance for water-related climate change impacts include those listed in the overview below: water, health, agriculture, disaster risk reduction, social security and insurance schemes, coastal protection, infrastructure and hydropower. The overview below also describes climate change and water impacts for human security and conflict within these policy areas. Examples of possible adaptation measures and policies for reducing these impacts are shown by manner of broad overview, to illustrate the range of possible approaches and relevant policies.

Overview: Adaptation measures by policy areas[xxx]

Policy Area	Human Security and Conflict Impacts	Possible Measures and Policies
Water management	Climate change is expected to significantly change the availability, distribution and quality of water resources, altering precipitation patterns and carrying implications for water supply, flooding, rain-fed agriculture and domestic and industrial water uses. Increased temperatures will also raise water evaporation rates. Decreased water availability for essential needs such as for drinking, sanitation, agriculture, and economic production, reduces human security. It also increases competition for scarce resources, which can lead to conflict between water users.	*Water storage and conservation techniques* *Water recycling and re-use* *Water-use and irrigation efficiency* *Desalination* *Rainwater harvesting* *Integrated water resources management* *River basin planning* *Market-based water allocations* *Drought and water conservation plans* *Increased reservoir capacity* *Inter-basin transfers* *Water education and awareness*
Health	From a water perspective, climate change will affect human health by increasing transmission and incidence of water-borne and vector-borne diseases, increasing occurrence of extreme weather	*Water quality regulation* *Improved water treatment and sanitation* *Watershed protection*

	events such as floods and droughts, and reducing water quality. Climate change may alter precipitation patterns and water flows, resulting in decreases in both water quantity and quality. As a result, less water or water of degraded quality may be available for sanitation and hygiene purposes. The physical well-being, of indivdidual which is a component of human security, may deteriorate as a result.	*Boil water alerts* *Improved hygiene and sanitation practices* *Vaccination programmes* *Behavioral and awareness campaigns* *Improved health management* *Health infrastructure development*
Agriculture	Agriculture is one of the most sensitive sectors to climate change and associated temperature and precipitation variability. Food production is dependent upon available water resources, for more than 80% of agriculture which is rain-fed as well as for irrigation supplies. Climate change is projected to impact crop yields, livestock management and agricultural practices and production, having major implications for global food security. Food security is an essential element of human security and a decrease in access and availability of food supplies will reduce human security. Competition for food as a scarce resource may increase, which can lead to conflicts between individuals and communities.	*Alter crop varieties* *Crop relocation* *Change planting dates* *Improved land management* *Soil protection, conservation and erosion control* *Increase irrigation efficiency* *Drip irrigation* *Change practices to conserve soil moisture and nutrients and reduce run-off* *Seed banking* *Agricultural insurance* *Compensation for impacts*
Disaster Risk Reduction (DRR)	Climate change is predicted to increase climatic and precipitation variability in many areas, resulting in a corresponding increase in climate-related disaster events such as floods, droughts and landslides and threats from these to human security and safety. Large-scale disaster situations may also lead to a situation of general instability and absence of effective governance, which may propel conflict.	*Early warning systems (flood and drought)* *Drought monitoring and communication* *Construction or alteration of dykes and dams* *Awareness campaigns* *Climate proofing flood prone areas* *Reduce floodplain development*
Social security and insurance	Climate change impacts and hazards are likely to negatively impact livelihoods for many populations, reducing employment,	*Insurance schemes* *Social security programs*

schemes	basic income, and economic security. Lessened economic security reduces resilience and human security.	
Coastal protection	In coastal zones, climate-induced sea level rise could have adverse impacts including greater flooding, coastal erosion and saltwater intrusion into groundwater supplies. Negative impacts to human security could result from hazards to human health and safety, infrastructure damage, forced migration, decreased water quality and available supplies, harm to agriculture and food security.	*Incorporate risks in development planning* *Building codes and zoning* *Rolling easements* *Set-backs and buffer zones.* *Seawalls and storm surge barriers* *Dune or wetland restoration, creation and preservation* *Beach renourishment* *Relocation*
Infrastructure	Infrastructure such as roads, rail systems, power generation facilities, water supply systems, sewage, buildings, and dykes or dams may be affected by climate-induced flooding, impairing basic living conditions, reducing services and limiting transport needed for satisfying a population's economic, food and health needs and thus protecting its human security.	*Risk and vulnerability assessment* *Building codes* *Improved drainage* *Water Sensitive Urban Design* *Adapt management and maintenance practices* *Integrate adaptation in investment decisions* *Physical barriers to protect installations*
Hydropower (energy)	Climatic changes to river runoff from rainfall and temperature variability will impact hydroelectric power generation, possibly reducing the ability of systems to meet energy demand to support households, services and economic production, for human security needs.	*Increase management flexibility* *Design alteration* *Increase reservoir storage* *Alternative energy supplies*

3.2. Mainstreaming/coordination/integration

Calls for mainstreaming climate adaptation into other activities and planning efforts, ranging from national and sectoral programmes and policies to individual projects such as road-building, are often heard. The mainstreaming of climate adaptation is relevant to human security in that through mainstreaming, existing policies and projects can be harnessed to improve human security in

certain respects, such as water and food security. More generally, it helps avoid setbacks in national priorities related to human security (such as economic development), and its sub-aspects such as water and food security, by helping avoid the impacts of water-related climatic hazards.

Mainstreaming is a particularly relevant approach in developing countries; these countries are particularly vulnerable to the negative impacts of climate change on human security, affecting aspects such as access to water, agricultural production, and food security and health. Whereas climate change impacts can impede development, sustainable development can increase resilience to climate change.[xxxi] Furthermore, development, like climate change, is cross-cutting in nature. Therefore, adaptation actions which support development policies can be taken in a variety of policy areas. International development cooperation addressing climate change adaptation generally involves integration of adaptation considerations into existing development processes, promoting activities to increase resilience to climatic impacts, and the mainstreaming of climate change concerns into development planning is increasingly being taken up.[xxxii]

This section first explains the meaning of the terms, then discusses the rationale for mainstreaming, proceeds to address the challenges involved, and finally highlights the main practical approaches for mainstreaming. Boxes in the text present policy examples, in which human security and conflict have been mainstreamed.

Mainstreaming, integration, coordination – what does it all mean?

"Mainstreaming" and **"integration"** are often used interchangeably, and imply the uptake of adaptation measures as part of a broader suite of measures within e.g. existing development processes and decision cycles.[xxxiii] Adaptation mainstreaming has been defined as an "iterative process of integrating adaptation considerations into policy-making, budgeting and implementation processes at national, sector and subnational levels. It is a multi-year, multi-stakeholder effort that entails working with government actors, non-governmental actors, and development actors."[xxxiv] Other topics have been mainstreamed into policy processes over the last decades; most prominent among these are gender issues and environmental concerns. Within the UN, attempts have been made to mainstream "human security" into different programmes and tools. This mainstreaming experience can provide important sources for tools, lessons-learned, and best-practice.

"Coordination" can be considered a sub-aspect of adaptation mainstreaming. Coordination of adaptation efforts between different institutions relevant to adaptation can help target efforts, avoid duplication, identify synergies, and avoid maladaptation. Coordination mechanisms between institutions ideally results in the strengthening of institutions, and can help make adaptation efforts sustainable thanks to its institutionalization of climate change adaptation.[xxxv] A further sub-aspect of adaptation mainstreaming is **"climate proofing"**, which refers to activities that aim to increase the climate resilience of existing policies, strategies, regulations, or plans which are being revised.[xxxvi]

The scope of adaptation mainstreaming can be broader or more narrow. In some contexts, "mainstreaming of climate change adaptation" is used narrowly when taking adaptation up in the management of a particular topic, e.g. coastal resource or freshwater resource management.[xxxvii] More often it is used in the context of objectives in individual policy areas, such as agriculture, health, and development policy. There are some instances of countries (e.g. Malawi[xxxviii] and

Ethiopia[xxxix]) which have gone further in that they are mainstreaming climate change adaptation into their national strategic visions and plans (such as development), which usually implies its progressive uptake in several different policy areas, e.g. agriculture, water, energy, development, infrastructure, and health, as well as poverty reduction programmes. Strategies in different policy areas are normally guided by broader national development policies, such as national visions, sustainable development strategies and poverty-reduction strategies.[xl] The terms "mainstreaming" or "integration" can also refer to different activities depending on which level one is looking at. Mainstreaming climate adaptation into agriculture will mean actions such as short term change of crops from the farm perspective, whereas from the perspective of the ministry it implies changes to long-term priorities and actions, including financing.

Rationales for mainstreaming

Including climate considerations (such as expected impacts and vulnerabilities) into planning processes has benefits such as helping to decrease population vulnerabilities, the vulnerability of the programmes themselves (e.g. infrastructure development), and to avoid maladaptation. As other environmental problems,[xli] climate change is a cross-cutting issue that does not fit into "ministerial boxes", which suggests the need for broader integration.

There is broad consensus on the benefits of **mainstreaming climate adaptation into different policy sectors** such as agriculture and development. Policy areas such as these take up significant shares of national budgets, and some of them present significant synergy potentials with adaptation. Ensuring that these sectoral activities unleash their potential to e.g. increase population resilience can have more positive impacts than stand-alone adaptation measures. In this way, adaptation to climate change can "piggy-back" implementation of policies in specific areas and their existing funding flows and activities.[xlii] Adaptation can also be incorporated into countries' strategic, long-term initiatives, such as development and poverty reduction strategies, making use of these significant efforts and resources to help decrease vulnerability to climate impacts.

Particularly **development activities** are often highlighted as **presenting strong synergies with adaptation**. "Business-as-usual" development is seen as often automatically helping improve adaptive capacity. However, some types of development projects can increase the vulnerability of societies to the impacts of climate change ("maladaptation"). Additionally, climate change can have negative effects on public goods such as infrastructure, as well as having the potential to quickly wipe out decades of progress in development and poverty reduction. This highlights the importance of integrating climate adaptation into development activities and strategies.[xliii]

From a donor/international actor perspective, supporting mainstreaming activities makes sense in view of the trend for (development) efforts to be led by the partner countries' own institutions and systems.[xliv] The Paris Declaration on Aid Effectiveness highlights that donors' main role is to provide support to countries' own priorities and national processes.[xlv] Support for the mainstreaming of adaptation into national institutions' programmes and plans helps ensure that international actors' adaptation activities have local institutions and systems that can implement these activities, and that they are in-line with national priorities.

Policy example: UN experiences with mainstreaming human security[xlvi]

Human security can provide a lens through which to view a broad range of threats to populations – including those caused by climate change impacts. Human security approaches have sometimes been described as being too vague, unrealistic and impractical to be used for policy formulation and implementation.[xlvii] However, the United Nations Human Security Unit (HSU) in the Office for the Coordination of Humanitarian Affairs has taken on the challenge of finding practical methods for operationalising the concept of human security. Established in 2004, the HSUs approach is two-fold: firstly it raises awareness on the benefits and added value of a human security approach within the UN system, and secondly manages the United Nations Trust Fund for Human Security (UNTFHS) to finance activities to translate the concept into practical activities on the ground. Since its founding in 1999, the UNTFHS has committed over USD 350 million to projects in over 80 countries.

The HSU tries to ensure that activities funded by the UNTFHS contribute to ensuring human security in a direct and tangible way. Projects must be informed by the tools set out in the HSUs Human Security Handbook and must operationalise a human security approach through 'collaborative, responsive and sustainable measures' that are: i) people-centred, ii) multisectoral iii) comprehensive iv) context-specific and v) prevention-oriented. Projects to receive financing must also meet a series of evaluation criteria. These criteria include the promotion of inter-agency cooperation to increase the impact of projects and avoiding the fragmentation and duplication of activities – an area in which the UN is currently striving to improve (United Nations 2006). Projects must furthermore be of a pilot and innovative nature so as to be replicated in other regions or countries, and sharing of lessons learned is encouraged. UNTFHS projects must include the implementation of a Human Security Impact Assessment (HSIA) for which the HSU provides detailed guidelines. The HSIA is carried out to ensure that the project action alleviates human insecurity and avoids negative outcomes as well as assesses the external environment and any changes to human security risks at the end of the project.

The HSU continues to raise awareness of human security throughout the UN, although it has some way to go to fully integrate these concerns across the UN system. However, the HSU is unique in that it has provided a concrete and in-depth methodology for operationalising a concept that is often seen as being too 'fuzzy' to be of any real use in policy-making circles. Initial comments from members of UN agencies implementing UNTFHS projects suggest that the HSU framework has provided a more holistic approach which has been positive in streamlining in-country efforts saving both time and money.

Challenges of mainstreaming

Experience with mainstreaming of topics such as the environment has highlighted some significant challenges to such a process.

For instance, the uptake of topics in national planning documents does not imply changes to the implementation of projects on the ground. There is the danger that topics end up having a token reference in this kind of documents, but are not translated into actions. To finance these actions,

"champions" are required which ensure that a topic does not disappear from view in e.g. budget discussion and expenditure frameworks.[xlviii]

On another front, the cross-sectoral nature of mainstreaming requires strong intersectoral coordination. At the same time, a cross-sectoral approach runs the risk that responsibility ends up diluted and that strategies become fragmented, due to the failure to effectively coordinate different strategy features and governance arrangements. Ownership of the individual adaptation activities in the different responsible institutions can end up suffering as a consequence.[xlix] To deal with the mainstreaming of this kind of cross-cutting issues, some literature recommends the issues being taken up by strong ministries, with sufficient political clout.[l] In the case of climate adaptation, environmental ministries are often thematically well- or best-suited; however, they frequently lack political weight.[li] More senior ministries, powerful central bodies such as the Office of the President or Prime Minister, or planning agencies are considered a better address for this responsibility.[lii]

Main approaches to mainstreaming

Good practical guidance documents on mainstreaming, with a focus on mainstreaming into development planning are OECD (2009) and UNDP-UNEP (2011). The following summarises some key points.

Include the national level:

The OECD (2009) report lists compelling arguments for addressing adaptation at the national level, as well as at the sectoral, project, and local level. The legislation and regulation that are set at this level often affect the climate risks facing the country, as well as creating the incentives for adaptation. They also constitute the overall policy and regulatory framework within which the lower levels operate, and this level determines budget allocations. Another reason is that coordination of sectoral policies and branches of government takes place at the national level.[liii]

Achieve clear recognition of climate risks and the need for adaptation within policies

A first step, which occurs in the policy formulation phase, is the uptake of climate change and adaptation in national visions, strategies, and policies. The incorporation of climate change and adaptation keywords "may help increase the importance of recognizing climate change and its impacts and the need to adapt to them".[liv] Trickle down effects could ensure, in view of lower levels (sectoral plans, projects) having to comply with higher level requirements. Stakeholders can make governments accountable if climate change and adaptation are taken up at national levels.

The same effects can ensure if sectoral policies take up climate change and adaptation. According to an OECD evaluation of 2009, adaptation would still not be high enough on the agenda of most sectoral ministries and donors. Even where climate variability is already being considered (e.g. water resource management), regulations and procedures would rely on historical climate as baseline, and not reflect how the baseline itself may change due to climate change.[lv]

A key tool: applying a climate lens

A frequently mentioned tool recommended at all levels (from the formulation of national policies and strategies and the planning stage of multi-year development plans all the way to project level)

is the application of a "climate lens".[lvi] This is an "analytical process/step/tool to examine a policy, plan or programme".[lvii] At the national policy or sectoral level, applying a climate lens involves examining:

"i) the extent to which the policy, strategy, regulation or plan under consideration could be vulnerable to risks arising from climate variability and change;

ii) the extent to which climate change risks have been taken into consideration in the course of programme formulation;

iii) the extent to which the policy, strategy, regulation or plan could lead to increased vulnerability, leading to maladaptation or, conversely, miss important opportunities arising from climate change; and

iv) for pre-existing policies, strategies, regulations or plans which are being revised, what amendments might be warranted in order to address climate risks and opportunities (sometimes referred to as "climate-proofing")." [lviii]

Use existing tools for climate adaptation

Tools already used in existing policy frameworks can, in some cases, also be used in the context of climate change adaptation. However, tools have to be evaluated carefully and possibly tailored to make sure they cover all aspects of climate change adaptation.

An example of this approach is the use of Strategic Environmental Assessments (SEAs). The term refers to a "a systematic process for evaluating the environmental consequences of proposed policy, plan or programme initiatives in order to ensure they are fully included and appropriately addressed at the earliest appropriate stage of decision making on par with economic and social considerations."[lix] SEAs provide a "ready entry point for climate change considerations in strategic decision making at the sector level".[lx] Currently, a growing number of developing countries and organizations are in the process of adopting legal requirements for SEAs. The incorporation of climate change considerations into SEAs could help identify the most sustainable strategy under different scenarios could be identified. It could also help identify which adaptation interventions could enhance the sector's resilience.

SEAs could also prove of value from a process perspective. These assessments seek to identify unsustainable options at a very early stage. They also involve broad consultation processes with a wide range of stakeholders. SEAs can help highlight capacity gaps and capacity development priorities, as a part of the SEA evaluation is related to requirements for implementation, including human resources. Possibly the most important aspect is that they offer a good framework to focus on linkages between a particular sector and other sectors, thus providing opportunities for identifying programmes which coordinate or integrate with other sectors.[lxi]

At a project level, there is less enthusiasm for the use of Environmental Impact Assessments (EIAs) as a way of incorporating climate considerations.[lxii] EIAs are often carried out once projects have been selected, and do not tend to alter significantly the projects' parameters. Hence, it is often more adequate to incorporate climate change considerations into the criteria used for screening project proposals. [lxiii]

Policy example: Mainstreaming conflict prevention into planning, programming, and project processes

Whereas the link of adaptation mainstreaming to conflict prevention is tenuous, conflict sensitivity and conflict prevention can themselves be mainstreamed into government or international actors' activities, thus helping reduce the potential for conflict. The mainstreaming of conflict sensitivity and of conflict prevention considerations can occur at different levels. The EU Commission, for instance, aims to mainstream conflict prevention into all elements of its programming and policy-making.[lxiv] Similarly, the UN System Staff College provides training in analysis of conflict prevention and in mainstreaming of conflict prevention into UN planning and programming.[lxv] However, independent evaluations have highlighted certain shortcomings of approaches such as that of the EU Commission. For instance, whereas guidelines on conflict prevention have been produced to assist officials drafting Country Strategy Papers (CSPs) and making decisions on programming, the uptake seems to depend on the presence of motivated individuals and on the advocacy of local civil society organizations. The mandatory incorporation of conflict analysis in these planning processes would be a possible mechanism that could help ensure conflict prevention is mainstreamed in all of the EU Commission's development cooperation, particularly in countries that are experiencing conflict or fragility.[lxvi]Some organizations have mainstreamed conflict sensitivity and conflict prevention into all their local interventions. An interesting example was provided by a representative of USAID in Ethiopia.[lxvii] In all interventions in Ethiopia USAID implements a "do-no-harm approach". The intervention is preceded by a conflict analysis which covers user groups of natural resources, people with user rights', property rights, etc. The analysis aims to ensure that interventions will not cause or aggravate conflicts. In addition, all implementing NGOs' staff members are trained in conflict sensitivity. USAID also works to clarify discordance over existing natural resources rights. With traditional rights' systems at odds with the current government ones, ensuing in lack of ownership and entitlement among possible stakeholders, USAID interventions are focusing on providing land-use and resource-use clarity to different stakeholder groups. In this way, interventions are helping reduce conflict potential in these areas, through the establishment of clear, negotiated and consensual agreement on land-use zoning.

4. Recommendations

How a policy in a specific country should look like, what concrete issues, population groups, sectors are best addressed is obviously highly context-specific. However, from the case studies and analysis conducted on existing policies as well as demands and suggestions interviewees made certain overarching and more general insights can be garnered on how "good" policies on human security and conflict prevention in the context of climate change could look like. Many of them apply to adaptation policies more broadly as well. We first provide recommendations for decision-makers at all policy levels and the turn to the national and international levels respectively.

Recommendations for policy-makers at all levels

- **Harness existing agendas for climate change adaptation:** There is evidence that it is easiest to put climate change adaptation high on the political agenda, where it can be connected to other political objectives that are considered important in a given context. For example, the Stern[lxviii] report that made clear which huge economic damages climate will probably cause, attracted quite a significant amount of public attention – obviously it could be tied in with a dominant economic discourse. Another example from our research is Ethiopia where climate change adaptation is very high on the agenda – given that it is strongly interlinked with the existing development agenda of the Ethiopian government. Adaptation measures and agendas should thus be framed in a way that demonstrates their relevance to current socio-economic or political debates e.g. economic crisis or human development, and craft a clear and targeted argument in this respect. This can both garner support and lead to cross-sectoral synergies that save resources and increase policy impact.
- **Learn from existing policy examples, but adapt them to local circumstances:** Adaptation is a relatively new field. At the same time, the impacts of climate change are often not more than the intensification of phenomena already known in a certain region (e.g. drought). Thus, in many cases experiences with addressing these issues have already been gained – elsewhere in the world, but potentially also locally. It is important to learn from past experiences, which are increasingly being published in online platforms or disseminated through trainings for policy-makers. At the same time, the situation in two countries or regions is rarely identical; thus, any existing solution needs to be reviewed as to whether it is suitable for the local context and how it needs to be adapted. Learning from policy examples can be facilitated through portals and platforms for information exchange where data and best-practice examples are shared.

Web-portals for climate change adaptation

The following list presents web-portals which gather knowledge on adaptation best practice, disseminate tools for adaptation, and to build communities for information-sharing.

Climate Adapt – European Climate Change Adaptation Platform: http://climate-adapt.eea.europa.eu/

Climate Adaptation Knowledge Exchange (CAKE): http://www.cakex.org

Climate Adaptation Learning Mechanism: http://www.adaptationlearning.net/

We Adapt: http://weadapt.org/

Climate Change Adaptation in Asia and the Pacific: http://www.asiapacificadapt.net/

UK Climate Impacts Programme (UKCIP): http://www.ukcip.org.uk/

The Community-based Risk Screening tool – Adaptation and Livelihoods (CRiSTAL): http://www.iisd.org/cristaltool/

UNFCCC pages on adaptation: http://unfccc.int/adaptation/items/4159.php

Support development of consistent, informed and long-term policy action

- Continue to fund research and science to support policies and increase confidence in the information on climate impacts at all levels.
- Avoid the use of frequently-changing 'buzzwords' and focus on policies which are integrated, well conceived and supported with a source of long-term finance. Measures effectively fostering climate change adaptation do not necessarily come with the label "climate change adaptation".

Recommendations for policy-makers at national and EU level

Improve awareness of water-related impacts of climate change among the general population

- Create public awareness campaigns on climate change impacts to ensure that citizens are conscious of climate induced risks, e.g. in the context of building in areas vulnerable to flash flooding. Where necessary protect these citizens by enforcing 'no-build zones' to prohibit construction.
- Increase public awareness on the need to save water and educate on the use of freshwater alternatives such as wastewater reuse. Ensure that water-saving campaigns and demand side management are first and foremost targeted at individuals and sectors with the highest usage rather than using blanket measures which could negatively impact water security of vulnerable groups.

Strengthen the knowledge base to formulate policies that reach their full potential for adapting to climate change and protecting human security

- Strengthen national and regional research capacity to develop precise and detailed data and climate models to understand localised impacts on water and to feed into support systems for policy makers to take informed decisions.
- Coordinate policies to create approaches which are multi-sectoral and integrated/mainstreamed. This allows a range of risks to human security to be taken into consideration and can create overall resource savings.

- Consider the value of bottom-up approaches such as indigenous water management systems and locally developed adaptation mechanisms and their synergies with larger scale or top-down policy approaches.

Draw on existing local knowledge, technologies, social structures:

- Besides making use of scientific knowledge, it is also important to tap into locally existing knowledge reservoirs – often local farmers, pastoralists or other people have for centuries adapted to changing and often adverse environmental conditions. This type of knowledge and traditional technologies can often be used effectively for climate change adaptation.
- Strong social networks e.g. at the community level will facilitate adaptation to climate change. Building on and strengthening these networks, e.g. through involving communities in the management of natural resources can facilitate adaptation.
- In many places, there are traditional mechanisms for conflict resolution at the local or community level. These mechanisms can be used to help resolve local conflicts over resources – with or without climate change.

Address underlying systemic issues

- Climate change can most effectively be addressed, if underlying institutional and governance issues in a given country or region are solved. The existence of institutions matters; thus, building such institutions or improving the functioning of existing ones matters. Poorly coordinated, corrupt institutions with badly trained staff are unlikely to be able to develop and implement effective policies to counter the effect of climate change.

Give priority to policies with co-benefits and no negative effects:

- Adaptation policies can have co-benefits. Enhancing human security is one of them. However, there are many other possible co-benefits; some adaptation options also are good mitigation options. Options that generate such extra benefits are preferable to those that do not. Generally, the focus in adaptation should, wherever possible, on "no-regrets" options, i.e. measures that contribute to equitable and sustainable policies more broadly
- Adaptation policies sometimes have negative side-effects. For example, some measures adopted in the past have caused or intensified conflict, in particular in circumstances where the local population did not support a government or donor-sponsored policy or project. Obviously, such cases of "maladaptation" should be avoided through appropriate tools, such as conflict-sensitive planning described above.

Increase coordination and strengthen capacity to ensure effective policy implementation

- Build capacity, raise awareness, and reinforce collaboration and information exchange amongst government officials at middle and regional levels to ensure widespread understanding and

dissemination of key policy messages for effective implementation and positive outcomes for adaptation and human security.

- Disseminate locally developed expertise in adapting to climate impacts both internally and amongst other states and regions that face similar challenges for facing water related impacts of climate change.

Provide guidance on mainstreaming/integration

- Produce easily understandable sectoral guidelines on standards for climate adaptation activities so that all institutions and departments can fully and practically integrate adaptation concerns in their day-to-day work.
- Give consideration to the practical meaning of mainstreaming and how this is best carried out.

Give due account to financial needs at an early planning stage

Obviously, climate change adaptation measures cost money. They may be relatively limited in cases where adaptation policies are merged with more general policies e.g. on strengthening institutional frameworks. Nonetheless, systematically incorporating the financial needs for adaptation into national budgets will not only make it possible to actually realize implementation measures, but also increase the political visibility of the topic.

Engage in long-term, but flexible planning

Although climate change is a phenomenon that will develop over a long period of time, a case can been made for commencing adaptation efforts and for incorporating adaptation into mid- and long-term planning as soon as possible. However, because many of climate change's precise impacts are not yet predictable, planning can often at best rely on ranges for future values (such as surface run-off). Incorporating projected climate change impacts into planning requires ensuring that projects and plans are considered desirable within the whole range of projected future values. Flexible planning can also take the form of modular implementation, e.g. purposely designing measures so that they can be expanded in view of future requirements. In this way, adaptation needs can be taken account in long-term strategies; at the same time, these strategies will have to be reviewed systematically at shorter intervals, in light of the actual developments on the ground and new scientific insights (following e.g. adaptive management approaches[lxix]). Incorporating periodic reviews in strategies and legislation ensure that this happens and improved or additional knowledge on climate impacts can be regularly incorporated into the planning cycle.

Recommendations for donors and actors at international level

Strengthen support so that it becomes systematised, substantial and sustainable

- Systematise support from the international community and focus on longer-term, interconnected interventions for positive outcomes in sustainable development, climate adaptation, conflict prevention and protection of human security.
- Strengthen large-scale and long-term finance for climate change adaptation and provide technical support and capacity building for developing countries to meet the sometimes complex and expensive requirements, both for obtaining finance and for absorbing the finance being provided.
- Develop cooperative and transboundary infrastructures to protect the immediate human security of migrants and people who are internally displaced by direct or indirect impacts of climate change, human security threats and conflict. Reduce the exploitation and illegal passage of migrants through livelihood diversification for traffickers who may themselves have turned to these activities as a cause of climate change impacts e.g. on farming.
- Raise awareness amongst policy makers on the need to act on less obvious and 'creeping' impacts of climate change such as drought and sea-level rise rather than focusing on sudden high-impact events such as floods. Provide support for developing longer term programmes in this regard.

Recognise and respect the boundaries of international action

- Build trust between donors and beneficiaries by supporting global action at UN level and ratifying and respecting international agreements on climate change and environment.
- Ensure that donors' and recipients' strategic frameworks, wishes and needs are increasingly aligned (in accordance with the 2005 Paris Declaration and the 2008 Accra Agenda for Action for aid effectiveness). Solutions should be demand-driven and based on in-depth analysis of the context to ensure their effectiveness.

Be aware of the impacts of support and finance

- Consider the potential effects that support and finance for adaptation or cooperation over water resources can have for creating new conflict or exacerbating existing tensions when planning policy interventions.
- Continue to improve inter-agency cooperation and coordination both within the UN and amongst international donors to avoid overlap and duplication of effort.
- Focus on politically neutral assistance through providing and supporting exchange of scientific information, technical and financial support and capacity-building. especially at regional and local level to avoid the sometimes over-politicised and thus less-efficient and effective nature of high-level regional cooperation. Where interaction is high-level, international actors should highlight the benefits of joint water resource management based on international law.

Provide implementation assistance

- Advocate for information to be placed in the public domain and exchanged without restrictions. Provide supportive mechanisms and platforms for global level information-exchange.
- Assist countries with climate change adaptation through issuing guidelines on best practice.
- International NGOs and donors should advocate for better cooperation between states over trans-boundary water management.
- Capitalise on existing social structures and bottom-up adaptation methods.

Endnotes

[i] See with relation to the Arab countries of the region UNDP - Regional Bureau for Arab States, *Arab Human Development Report - Challenges to Human Security in the Arab Countries* (New York: UNDP, 2009).
[ii] Brown and Crawford, *Rising Temperatures, Rising Tensions – Climate Change and the Risk of Violent Conflict in the Middle East, IISD: Winnipeg*.
[iii] Christiane Gerstetter et al., *The Effectiveness for Policy Frameworks for Addressing Climate-induced Risks to Human Security and Conflict – Report on Stakeholder Perspectives and Demands*, CLICO Working Papers (Berlin: Ecologic Institute, 2012), http://ecologic.eu/4884.
[iv] Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen (WBGU), *Sicherheitsrisiko Klimawandel* (Berlin; Heidelberg: Springer, 2007), http://www.wbgu.de/index.php?id=111/; Brown and Crawford, *Rising Temperatures, Rising Tensions – Climate Change and the Risk of Violent Conflict in the Middle East, IISD: Winnipeg,*.
[v] Personal communication Gebru Doc, Climate Change Forum for Ethiopia
[vi] Ibid.
[vii] Personal communication Admasu Tessema, USAID Ethiopia
[viii] A similar conclusion is presented in Kate Urwin and Andrew Jordan, "Does Public Policy Support or Undermine Climate Change Adaptation? Exploring Policy Interplay Across Different Scales of Governance," *Global Environmental Change* 18, no. 1 (February 2008): 180–191.
[ix] Personal communication, Fassil Reda, Ethiopian Agricultural Research Organization
[x] UNDP, *New Dimensions of Human Security*, Human Development Report (UNDP: New York, 1994), 23, http://hdr.undp.org/en/reports/global/hdr1994/.
[xi] Barry Smit and Johanna Wandel, "Adaptation, Adaptive Capacity and Vulnerability," *Global Environmental Change* 16, no. 3 (August 2006): 282, http://www.sciencedirect.com/science/article/pii/S0959378006000410.
[xii] Jon Barnett, "Security and Climate Change," *Global Environmental Change* 13, no. 1 (April 2003): 211, http://www.sciencedirect.com/science/article/B6VFV-48B5KTX-1/2/feeb5265a62d0a78371ee21f111e81a7.
[xiii] Intergovernmental Panel on Climate Change, *Climate Change 2001: Overview of Impacts, Adaptation, and Vulnerability to Climate Change 2001, Working Group II: Impacts, Adaptation and Vulnerability, IPCC Third Assessment Report* (Cambridge: Cambridge University Press, 2001), 6, http://www.grida.no/publications/other/ipcc_tar/.
[xiv] Richard J. T. Klein, Robert J. Nicholls, and Frank Thomella, "Resilience to Natural Hazards: How Useful Is This Concept?," *Global Environmental Change Part B: Environmental Hazards* 5, no. 1–2 (2003): 35–43.
[xv] Gilberto C. Gallopín, "Linkages Between Vulnerability, Resilience, and Adaptive Capacity," *Global Environmental Change* 16, no. 3 (August 2006): 301, http://www.sciencedirect.com/science/article/pii/S0959378006000409.
[xvi] For a more in-depth presentation of the results, see Christiane Gerstetter et al., *The Effectiveness for Policy Frameworks for Addressing Climate-induced Risks to Human Security and Conflict – Report on Stakeholder Perspectives and Demands*.
[xvii] For other possible classifications see Anita Wreford, Dominic Moran, and Neil Adger, "Adaptation," in *Climate Change and Agriculture* (OECD Publishing, 2010), 59–77, http://www.keepeek.com/Digital-Asset-Management/oecd/agriculture-and-food/climate-change-and-agriculture/adaptation_9789264086876-7-en; Stephen N. Ngigi, *Climate Change Adaptation Strategies - Water Resources Management Options for Smallholder Farming Systems in Sub-saharan Africa* (New York: The Earth Institute at Columbia University and The MDG Centre, East and Southern Africa, 2009).
[xviii] Ngigi, *Climate Change Adaptation Strategies - Water Resources Management Options for Smallholder Farming Systems in Sub-saharan Africa*; Wreford, Moran, and Adger, "Adaptation."
[xix] See for a description Ulrich Hess, Kaspar Richter, and Andrea Stoppa, *Weather Risk Management for Agriculture and Agri-Business in Developing Countries* (Washington DC: International Finance Corporation, The World Bank, 2004), 8f, http://www.agriskmanagementforum.org/farmd/sites/agriskmanagementforum.org/files/Documents/Weather_Risk_Management.pdf.
[xx] See for the above Ethemcan Turhan, *Policy Analysis of Turkish Agricultural Insurance and National Strategy and Action Plan on Combating Agricultural Drought* (Berlin: Ecologic Institute, 2011), http://ecologic.eu/4366.
[xxi] Tompkins, Emma L. and Adger, Neil, "Does Adaptive Management of Natural Resources Enhance Resilience to Climate Change?".
[xxii] Tawfic Ahmed, Mohamed and Loutfy Naglaa, *Policy Response to Climate Change, Egypt - CLICO Case Study* (Berlin: Ecologic Institute, 2011), http://www.ecologic.eu/download/projekte/2700-2749/2703/CLICO_%204_1_main_report_plus_annex.pdf.
[xxiii] See for example various contributions in Transparency International, ed., *Global Corruption Report: Climate Change* (Earthscan, 2011).
[xxiv] See Thomas V. Cech, *Principles of Water Resources: History, Development, Management, and Policy*, 3rd ed. (Wiley, 2010) and El Tribunal de las Aguas de la Vega de Valencia. Accessed 18 July 2012 at: http://www.tribunaldelasaguas.com/.

[xxv] Wreford, Moran, and Adger, "Adaptation," 60.
[xxvi] WHO Regional Office for Europe, *Floods: Climate Change and Adaptation Strategies for Human Health: Report on a WHO Meeting* (Copenhagen, Denmark: WHO Regional Office for Europe, 2002), 1.
[xxvii] UNFCCC, *Technologies for Adaptation to Climate Change* (Bonn, Germany, 2010), 30.
[xxviii] WHO Regional Office for Europe, *Floods: Climate Change and Adaptation Strategies for Human Health: Report on a WHO Meeting*, 43.
[xxix] Molly Hellmuth et al., *Increasing Food Security with Agrometeorological Information: Mali's National Meteorological Service Helps Farmers Manage Climate Risk*, World Resources Report (Washington D.C., 2010), http://www.worldresourcesreport.org.
[xxx] This overview is based on Charles Batchelor, Stef Smits, and A.J. James, *Adaptation of WASH Services Delivery to Climate Change and Other Sources of Risk and Uncertainty (Thematic Overview Paper 24)* (The Hague, July 2011), http://www.irc.nl/top24; OECD, *Policy Guidance on Integrating Climate Change Adaptation into Development Co-operation* (Paris: OECD, 2009), http://www.oecd.org/document/40/0,3343,en_2649_34421_42580264_1_1_1_1,00.html; UNDP, *A Toolkit for Designing Climate Change Adaptation Initiatives*, 2010; UNFCCC, *Technologies for Adaptation to Climate Change*; WHO, *Climate Change and Human Health - Risks and Responses*, 2003, http://www.who.int/globalchange/publications/cchhsummary/en/; Christiane Gerstetter et al., *Review of International and National Policies and Institutional Frameworks*, CLICO Working Paper (Berlin: Ecologic Institute, 2011); UK Secretary of State for Environment, Food and Rural Affairs, *Climate Resilient Infrastructure: Preparing for a Changing Climate* (London, 2011), http://www.defra.gov.uk/publications/files/climate-resilient-infrastructure-full.pdf; European Commission, *White Paper: Adapting to Climate Change: Towards a European Framework for Action* (Brussels: European Commission, 2009), http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0147:FIN:EN:PDF.
[xxxi] Jessica M. Ayers and Saleemul Huq, *Supporting Adaptation to Climate Change: What Role for Official Development Assistance?* (Winnipeg: International Institute for Sustainable Development, 2008), http://www.iied.org/supporting-adaptation-climate-change-what-role-for-official-development-assistance.
[xxxii] Heather McGray, Anne Hammill, and Rob Bradley, *Weathering the Storm: Options for Framing Adaptation and Development* (World Resources Institute, 2007); OECD, *Policy Guidance on Integrating Climate Change Adaptation into Development Co-operation*.
[xxxiii] OECD, *Policy Guidance on Integrating Climate Change Adaptation into Development Co-operation*, 60.
[xxxiv] UNDP-UNEP Poverty-Environment Facility, *Mainstreaming Climate Change Adaptation into Development Planning: A Guide for Practitioners*, 2011, 80, http://www.unep.org/pdf/mainstreaming-cc-adaptation-web.pdf.
[xxxv] Ibid., 12.
[xxxvi] OECD, *Policy Guidance on Integrating Climate Change Adaptation into Development Co-operation*, 27.
[xxxvii] Huq, Saleemul et al., *Mainstreaming Adaptation to Climate Change in Least Developed Countries (LDCs)* (London: International Institute for Environment and Development, 2003), 28, http://www.un.org/special-rep/ohrlls/ldc/LDCsreport.pdf.
[xxxviii] UNDP-UNEP Poverty-Environment Facility, *Mainstreaming Climate Change Adaptation into Development Planning: A Guide for Practitioners*, 24.
[xxxix] Rodrigo Vidaurre and Elizabeth Tedsen, The Effectiveness for Policy Frameworks for Addressing Climate-induced Risks to Human Security and Conflict – Report on Stakeholder Perspectives and Demands. Case Study on Ethiopia (Berlin: Ecologic Institute, 2012), http://ecologic.eu/4884.
[xl] OECD, *Policy Guidance on Integrating Climate Change Adaptation into Development Co-operation*, 92.
[xli] Peters G., "Managing Horizontal Government: The Politics of Co-Ordination," *Public Administration* 76 (1998): 296.
[xlii] In the field of the environment, this is the logic behind the uptake of environmental criteria in the EU's Common Agricultural Policy. The "greening" of CAP measures includes additional criteria and environmental objectives to the very significant funding schemes of CAP.
[xliii] OECD, *Policy Guidance on Integrating Climate Change Adaptation into Development Co-operation*, 56.
[xliv] Ibid., 66.
[xlv] Ibid., 84.
[xlvi] This overview based on the following sources: Personal communication Huw Beynon (Human Security Unit, Office for the Coordination of Humanitarian Affairs, United Nations); United Nations Trust Fund for Human Security. 'Trust Fund Overview' Accessed 18 July 2012 at: http://ochaonline.un.org/humansecurity/Home/tabid/2097/language/en-US/Default.aspx; United Nations (2006). 'Delivering as One'. Secretary-General's High-Level Panel on UN System-wide Coherence in the Areas of Development, Humanitarian Assistance, and the Environment; Human Security Unit, Office for the Coordination of Humanitarian Affairs, United Nations (2009). 'Human Security in Theory and Practice. Application of the Human Security Concept and the United Nations Trust Fund for Human Security'. 2009; Human Security Unit, Office for the Coordination of Humanitarian Affairs, United Nations (2011). 'Guidelines for the United Nations Trust Fund for Human Security'. 6th Revision 17 June 2011

[xlvii] Janne Haaland Matlary, "Much Ado About Little: The EU and Human Security," International Affairs 84, no. 1 (2008): 131–143.
[xlviii] Reinhard Steurer, "Strategies for Sustainable Development," in *Innovation in Environmental Policy?: Integrating the Environment for Sustainability*, ed. Andrew J. Jordan and Andrea Lenschow (Edward Elgar Publishing Ltd, 2008), 93–113.
[xlix] Ibid.
[l] Tom Mitchell, Thomas Tanner, and Emily Wilkinson, *Overcoming the Barriers. Mainstreaming Climate Change Adaptation in Developing Countries* (London: Institute of Development Studies, 2006), 19, http://www.tearfund.org/webdocs/website/Campaigning/Policy%20and%20research/Overcoming%20the%20barriers%20briefing%20paper.pdf; OECD, *Policy Guidance on Integrating Climate Change Adaptation into Development Co-operation*, 74.
[li] OECD, *Policy Guidance on Integrating Climate Change Adaptation into Development Co-operation*, 74.
[lii] Ibid., 90.
[liii] Ibid., 70f.
[liv] Ibid., 78.
[lv] Ibid., 115.
[lvi] See for example OECD, *Policy Guidance on Integrating Climate Change Adaptation into Development Co-operation*; UNDP-UNEP Poverty-Environment Facility, *Mainstreaming Climate Change Adaptation into Development Planning: A Guide for Practitioners*.
[lvii] OECD, *Policy Guidance on Integrating Climate Change Adaptation into Development Co-operation*, 74.
[lviii] See ibid., 79.
[lix] Definition of Sadler and Verheem (1996), taken from United Nations University and Oxford Brookes University course module on SEA, http://sea.unu.edu/course/?page_id=25.
[lx] OECD, *Policy Guidance on Integrating Climate Change Adaptation into Development Co-operation*, 101.
[lxi] Ibid.
[lxii] Ibid., 123.
[lxiii] Ibid., 106.
[lxiv] Sara Erlandsson, *Mainstreaming Conflict Prevention - a Study of EU Development Cooperation with ACP Countries* (Brussels: The Quaker Council for European Affairs, 2009), http://www.qcea.org/wp-content/uploads/2011/04/rprt-mcp2-main-en-jan-2009.pdf.
[lxv] Cf. http://www.unssc.org/home/learning-product/mainstreaming-conflict-prevention-un-planning-and-programming-processes
[lxvi] Erlandsson, *Mainstreaming Conflict Prevention - a Study of EU Development Cooperation with ACP Countries*, 5.
[lxvii] Personal communication, Mr. Dubale Admasu Tessema, Ethiopia, November 2011.
[lxviii] Nicholas Stern, *The Economics of Climate Change: The Stern Review* (Cambridge, UK: Cambridge University Press, 2007).
[lxix] Adaptive Management, a management approach in the face of uncertainty, is particularly popular in natural resources management. For a discussion on adaptive management in water, see Claudia Pahl-Wostl, "Transitions Towards Adaptive Management of Water Facing Climate and Global Change," *Water Resources Management* 21 (2007): 49–62.

References

Ayers, Jessica M., and Saleemul Huq. *Supporting Adaptation to Climate Change: What Role for Official Development Assistance?* Winnipeg: International Institute for Sustainable Development, 2008. http://www.iied.org/supporting-adaptation-climate-change-what-role-for-official-development-assistance.

Barnett, Jon. "Security and Climate Change." *Global Environmental Change* 13, no. 1 (April 2003): 7–17. http://www.sciencedirect.com/science/article/B6VFV-48B5KTX-1/2/feeb5265a62d0a78371ee21f111e81a7.

Batchelor, Charles, Stef Smits, and A.J. James. *Adaptation of WASH Services Delivery to Climate Change and Other Sources of Risk and Uncertainty (Thematic Overview Paper 24)*. The Hague, July 2011. http://www.irc.nl/top24.

Brown, Oli, and Alec Crawford. *Rising Temperatures, Rising Tensions – Climate Change and the Risk of Violent Conflict in the Middle East, IISD: Winnipeg,*. Winnipeg: IISD, 2009.

Cech, Thomas V. *Principles of Water Resources: History, Development, Management, and Policy*. 3rd ed. Wiley, 2010.
Christiane Gerstetter, Katriona McGlade, Rodrigo Vidaurre, Elizabeth Tedsen, and Haran Bar-On. *The Effectiveness for Policy Frameworks for Addressing Climate-induced Risks to Human Security and Conflict – Report on Stakeholder Perspectives and Demands*. CLICO Working Papers. Berlin: Ecologic Institute, 2012. http://ecologic.eu/4884.
Erlandsson, Sara. *Mainstreaming Conflict Prevention - a Study of EU Development Cooperation with ACP Countries*. Brussels: The Quaker Council for European Affairs, 2009. http://www.qcea.org/wp-content/uploads/2011/04/rprt-mcp2-main-en-jan-2009.pdf.
European Commission. *White Paper: Adapting to Climate Change: Towards a European Framework for Action*. Brussels: European Commission, 2009. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0147:FIN:EN:PDF.
Gallopín, Gilberto C. "Linkages Between Vulnerability, Resilience, and Adaptive Capacity." *Global Environmental Change* 16, no. 3 (August 2006): 293–303. http://www.sciencedirect.com/science/article/pii/S0959378006000409.
Gerstetter, Christiane, Eleftheria Kampa, Katriona McGlade, and Krista Timeus. *Review of International and National Policies and Institutional Frameworks*. CLICO Working Paper. Berlin: Ecologic Institute, 2011.
Hellmuth, Molly, Daouda Zan Diarra, Catherine Vaughan, and Remi Cousin. *Increasing Food Security with Agrometeorological Information: Mali's National Meteorological Service Helps Farmers Manage Climate Risk*. World Resources Report. Washington D.C., 2010. http://www.worldresourcesreport.org.
Hess, Ulrich, Kaspar Richter, and Andrea Stoppa. *Weather Risk Management for Agriculture and Agri-Business in Developing Countries*. Washington DC: International Finance Corporation, The World Bank, 2004. http://www.agriskmanagementforum.org/farmd/sites/agriskmanagementforum.org/files/Documents/Weather_Risk_Management.pdf.
Huq, Saleemul, Atiq Rahman, Mama Konate, Youba Sokona, and Hannah Reid. *Mainstreaming Adaptation to Climate Change in Least Developed Countries (LDCs)*. London: International Institute for Environment and Development, 2003. http://www.un.org/special-rep/ohrlls/ldc/LDCsreport.pdf.
Intergovernmental Panel on Climate Change. *Climate Change 2001: Overview of Impacts, Adaptation, and Vulnerability to Climate Change 2001, Working Group II: Impacts, Adaptation and Vulnerability, IPCC Third Assessment Report*. Cambridge: Cambridge University Press, 2001. http://www.grida.no/publications/other/ipcc_tar/.
Klein, Richard J. T., Robert J. Nicholls, and Frank Thomella. "Resilience to Natural Hazards: How Useful Is This Concept?" *Global Environmental Change Part B: Environmental Hazards* 5, no. 1–2 (2003): 35–43.
Matlary, Janne Haaland. "Much Ado About Little: The EU and Human Security." *International Affairs* 84, no. 1 (2008): 131–143.
McGray, Heather, Anne Hammill, and Rob Bradley. *Weathering the Storm: Options for Framing Adaptation and Development*. World Resources Institute, 2007.
Ngigi, Stephen N. *Climate Change Adaptation Strategies - Water Resources Management Options for Smallholder Farming Systems in Sub-saharan Africa*. New York: The Earth Institute at Columbia University and The MDG Centre, East and Southern Africa, 2009.
OECD. *Policy Guidance on Integrating Climate Change Adaptation into Development Co-operation*. Paris: OECD, 2009. http://www.oecd.org/document/40/0,3343,en_2649_34421_42580264_1_1_1_1,00.html.
Pahl-Wostl, Claudia. "Transitions Towards Adaptive Management of Water Facing Climate and Global Change." *Water Resources Management* 21 (2007): 49–62.

Peters G. “Managing Horizontal Government: The Politics of Co-Ordination.” *Public Administration* 76 (1998): 295 – 311.
Smit, Barry, and Johanna Wandel. “Adaptation, Adaptive Capacity and Vulnerability.” *Global Environmental Change* 16, no. 3 (August 2006): 282–292. http://www.sciencedirect.com/science/article/pii/S0959378006000410.
Stern, Nicholas. *The Economics of Climate Change: The Stern Review*. Cambridge, UK: Cambridge University Press, 2007.
Steurer, Reinhard. “Strategies for Sustainable Development.” In *Innovation in Environmental Policy?: Integrating the Environment for Sustainability*, edited by Andrew J. Jordan and Andrea Lenschow, 93–113. Edward Elgar Publishing Ltd, 2008.
Tawfic Ahmed, Mohamed, and Loutfy Naglaa. *Policy Response to Climate Change, Egypt - CLICO Case Study*. Berlin: Ecologic Institute, 2011. http://www.ecologic.eu/download/projekte/2700-2749/2703/CLICO_%204_1_main_report_plus_annex.pdf.
Tom Mitchell, Thomas Tanner, and Emily Wilkinson. *Overcoming the Barriers. Mainstreaming Climate Change Adaptation in Developing Countries*. London: Institute of Development Studies, 2006. http://www.tearfund.org/webdocs/website/Campaigning/Policy%20and%20research/Overcoming%20the%20barriers%20briefing%20paper.pdf.
Tompkins, Emma L., and Adger, Neil. “Does Adaptive Management of Natural Resources Enhance Resilience to Climate Change?” *Ecology and Society* 9, no. 2 (2004): 10–24. http://www.ecologyandsociety.org/vol9/iss2/art10/.
Transparency International, ed. *Global Corruption Report: Climate Change*. Earthscan, 2011.
Turhan, Ethemcan. *Policy Analysis of Turkish Agricultural Insurance and National Strategy and Action Plan on Combating Agricultural Drought*. Berlin: Ecologic Institute, 2011. http://ecologic.eu/4366.
UK Secretary of State for Environment, Food and Rural Affairs. *Climate Resilient Infrastructure: Preparing for a Changing Climate*. London, 2011. http://www.defra.gov.uk/publications/files/climate-resilient-infrastructure-full.pdf.
UNDP - Regional Bureau for Arab States. *Arab Human Development Report - Challenges to Human Security in the Arab Countries*. New York: UNDP, 2009.
UNDP. *A Toolkit for Designing Climate Change Adaptation Initiatives*, 2010.
———. *New Dimensions of Human Security*. Human Development Report. UNDP: New York, 1994. http://hdr.undp.org/en/reports/global/hdr1994/.
UNDP-UNEP Poverty-Environment Facility. *Mainstreaming Climate Change Adaptation into Development Planning: A Guide for Practitioners*, 2011. http://www.unep.org/pdf/mainstreaming-cc-adaptation-web.pdf.
UNFCCC. *Technologies for Adaptation to Climate Change*. Bonn, Germany, 2010.
Urwin, Kate, and Andrew Jordan. “Does Public Policy Support or Undermine Climate Change Adaptation? Exploring Policy Interplay Across Different Scales of Governance.” *Global Environmental Change* 18, no. 1 (February 2008): 180–191.
Vidaurre, Rodrigo, and Elizabeth Tedsen. *The Effectiveness for Policy Frameworks for Addressing Climate-induced Risks to Human Security and Conflict – Report on Stakeholder Perspectives and Demands. Case Study on Ethiopia*. Berlin: Ecologic Institute, 2012. http://ecologic.eu/4884.
WHO. *Climate Change and Human Health - Risks and Responses*, 2003. http://www.who.int/globalchange/publications/cchhsummary/en/.
WHO Regional Office for Europe. *Floods: Climate Change and Adaptation Strategies for Human Health: Report on a WHO Meeting*. Copenhagen, Denmark: WHO Regional Office for Europe, 2002.

Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen (WBGU). *Sicherheitsrisiko Klimawandel*. Berlin; Heidelberg: Springer, 2007. http://www.wbgu.de/index.php?id=111/.

Wreford, Anita, Dominic Moran, and Neil Adger. "Adaptation." In *Climate Change and Agriculture*, 59–77. OECD Publishing, 2010. http://www.keepeek.com/Digital-Asset-Management/oecd/agriculture-and-food/climate-change-and-agriculture/adaptation_9789264086876-7-en.