A New Climate for Peace

Taking Action on Climate and Fragility Risks

An independent report commissioned by the G7 members

An independent report commissioned by the G7 members
Submitted under the German G7 Presidency

G7 GERMANY
2015 | Schloss Elmau

Disclaimer:
The analysis, results, and recommendations are those of the authors only and do not represent the official position of the G7 or any of its member countries.

Lead Authors:
Lukas Rüttinger, Dan Smith, Gerald Stang, Dennis Tänzler, and Janani Vivekananda

Contributing Authors:
Oli Brown, Alexander Carius, Geoff Dabelko, Roger-Mark De Souza, Shreya Mitra, Katharina Nett, Meaghan Parker, and Benjamin Pohl

Editor:
Meaghan Parker

Design:
Lucid. Berlin

Print:
PRINTPRINZ GmbH

Cover Picture:
NASA / Johnson Space Center

© adelphi, International Alert, Woodrow Wilson International Center for Scholars, European Union Institute for Security Studies, 2015

RECYCLED
Paper made from recycled material
FSC® C084205

A New Climate for Peace

Taking Action on Climate and Fragility Risks

adelphi

International Alert.

The Wilson Center

European Union Institute for Security Studies

Contents

Figures, Boxes, and Tables iv
Executive Summary vii

1 Introduction 1

1.1 The G7's leadership on climate change and fragility 1
1.2 What makes this report unique 2
1.3 Methodology 2
1.4 Structure of this report 3

2 Compound Climate-Fragility Risks 5

2.1 Climate change and fragility 5
2.2 Local resource competition 16
2.3 Livelihood insecurity and migration 26
2.4 Extreme weather events and disasters 34
2.5 Volatile food prices and provision 42
2.6 Transboundary water management 51
2.7 Sea-level rise and coastal degradation 58
2.8 Unintended effects of climate policies 64
2.9 Conclusions 72

3 Policy Analysis: An Integrated Agenda for Resilience 77

3.1 Climate change adaptation 81
3.2 Development and humanitarian aid 89
3.3 Peacebuilding 99
3.4 Conclusions 105

4 Recommendations: A New Commitment for Resilience 109

4.1 Recommendation 1: Integration begins at home 111
4.2 Recommendation 2: Come together for a new dialogue 112
4.3 Recommendation 3: Set the global resilience agenda 113
4.4 Recommendation 4: Partner for resilience 115
4.5 Five action areas 117
4.6 A new commitment: The foundation for a more peaceful and more resilient future 123

List of Abbreviations 124
Glossary 126
Bibliography 129

Figures, Boxes, and Tables

FIGURES

Figure 1 Pressures and shocks are expected to increase in the future 8
Figure 2 Planetary boundaries 11
Figure 3 Climate risks are cross-cutting 12
Figure 4 From fragility to resilience 13
Figure 5 Situations of fragility 14
Figure 6 Rain-fed agriculture and conflicts 18
Figure 7 Risk factors around natural resources 19
Figure 8 Fragility hotspots 37
Figure 9 The commodity super-cycle 44
Figure 10 Global food crises 46
Figure 11 Heat map: Where is the highest risk of water conflict? 52
Figure 12 Seven compound climate-fragility risks threaten states and societies 73
Figure 13 Survey insights: Is our risk analysis shared by decision-makers and foreign policy practitioners? 75
Figure 14 An integrated agenda for resilience 78
Figure 15 Survey insights: Existing initiatives and policies 80
Figure 16 Building resilience in a changing climate 84
Figure 17 Humanitarian disaster response: How to 'do no harm' 92
Figure 18 ODA recipients 2011 94
Figure 19 Identifying effective interventions 97
Figure 20 Recommendations: A new commitment for resilience 116

BOXES

Box 1 Regional consultations 3
Box 2 Selection of risks 15
Box 3 Darfur: Climate change and pastoralist conflicts 22
Box 4 Ethiopia: Land grabs and the global farms race 23
Box 5 India: Competition over water 24
Box 6 Mozambique: Competition over land 25
Box 7 Syria: Drought, livelihood insecurity, migration, and conflict 30
Box 8 Mali: Drought and the Tuareg rebellion 31
Box 9 Guatemala: The coffee leaf rust outbreak 32
Box 10 Sierra Leone: Climate change, decreasing fisheries, and livelihoods at risk 33
Box 11 Thailand: Poor response to flooding has severe political consequences 38
Box 12 Indian Ocean tsunami: Comparing Sri Lanka and Aceh, Indonesia 39
Box 13 Pakistan: Flood mismanagement and fragility 40

Box 14 Kenya: Slow-onset droughts and security issues ... 41
Box 15 Egypt: The 2011 political crisis and bread riots ... 48
Box 16 Jordan: Food and water scarcity, refugees, and conflict ... 49
Box 17 Myanmar: Rice price volatility ... 50
Box 18 Nile River basin: Climate change, overconsumption, and upstream development ... 56
Box 19 Indus River basin and access to water ... 57
Box 20 Bangladesh: Coastal degradation and migration ... 61
Box 21 Kiribati: A nation under threat ... 62
Box 22 Spratly Islands: Disputed territory ... 63
Box 23 Rwanda: Disaster risk management increases fragility ... 68
Box 24 Global Alliance: Climate-smart agriculture and the private sector ... 69
Box 25 Global impacts of Arctic melting ... 70
Box 26 The New Deal for Engagement in Fragile States and the g7+ ... 79
Box 27 Sectoral approaches: Food security ... 87
Box 28 Sectoral approaches: Transboundary water ... 99
Box 29 The five Peacebuilding and Statebuilding Goals ... 101

TABLES

Table 1 Local resource competition ... 16
Table 2 Livelihood insecurity and migration ... 26
Table 3 Extreme weather events and disasters ... 34
Table 4 Volatile food prices and provision ... 42
Table 5 Transboundary water management ... 51
Table 6 Sea-level rise and coastal degradation ... 58
Table 7 Unintended effects of climate policies ... 64
Table 8 Integrating fragility into climate change adaptation policies ... 81
Table 9 UNFCCC and Kyoto Protocol funds supporting adaptation ... 86
Table 10 Integrating climate adaptation and fragility into development and humanitarian aid policies ... 89
Table 11 Commitments and approvals by multilateral development banks to fragile states in 2013 ... 95
Table 12 Integrating climate adaptation into peacebuilding policies ... 99
Table 13 Integration begins at home ... 111
Table 14 Come together for a new dialogue ... 112
Table 15 Set the global agenda ... 113
Table 16 Partner for resilience ... 115
Table 17 Five action areas ... 117

Executive Summary

Climate change is a global threat to security in the 21st century. We must act quickly to limit the future risks to the planet we share and to the peace we seek.

Achieving a robust agreement to reduce greenhouse gas emissions is of paramount importance. Yet the relentless momentum of change means that despite future emissions reductions, the physical impacts of anthropogenic climate change are already visible and will continue for decades to come.

Climate change will stress the world's economic, social, and political systems. Where institutions and governments are unable to manage the stress or absorb the shocks of a changing climate, the risks to the stability of states and societies will increase.

The sharpest risks emerge when the impacts of climate change overburden weak states. Climate change is the ultimate 'threat multiplier': it will aggravate already fragile situations and may contribute to social upheaval and even violent conflict.

While all will feel the effects of climate change, the people in the poorest countries—and the most vulnerable groups within those countries—are the most threatened. In places affected by fragility and conflict, people face especially challenging obstacles to successful adaptation. If they fail to adapt to the effects of climate change, the risk of instability will increase, trapping them in a vicious cycle.

But even seemingly stable states can be pushed towards fragility if the pressure is high enough or the shock is too great for systems to manage peacefully. Peace and security are paramount for all of us. We all share the risks—and thus we share the responsibility for tackling them.

A New Climate for Peace: Taking Action on Climate and Fragility Risks, an independent report commissioned by members of the G7, identifies seven compound climate-fragility risks that pose serious threats to the stability of states and societies in the decades ahead. Based on a thorough assessment of existing policies on climate change adaptation, development cooperation and humanitarian aid, and peacebuilding, this report recommends that the G7 take concrete action, both as individual members and jointly, to tackle climate-fragility risks and increase the resilience of states and societies to them.

Seven Compound Climate-Fragility Risks

The planet's limited resources are under pressure. While the global marketplace provides a growing number of people with a seemingly unending flow of goods, too many people in developing countries struggle to meet their daily needs, with limited access to basic services and functional markets.

Demand for food, water, and energy is increasing, particularly where the population or the economy is growing rapidly. Widespread unemployment, rapid urbanization, and environmental degradation challenge efforts to reduce poverty and increase economic development in many poor countries. In fragile regions, persistent inequality, political marginalization, and unresponsive governments exacerbate these stresses, increasing the potential for instability and conflict. Adding the impacts of a changing climate on water, food, and land will multiply these pressures and strain countries' ability to meet their citizens' needs.

The capacity of states and societies to meet this challenge can be measured along a spectrum of fragility, from most fragile to most resilient. Resilient states build constructive relationships with their citizens, maintain functioning institutions, and provide basic services. Resilient countries can absorb shocks and handle stresses peacefully, while maintaining political stability and preventing violence.

Fragile situations, on the other hand, arise when states cannot provide basic services, protect their citizens, or develop mutually constructive relations with society. Even states that are otherwise stable may endure periods of fragility or harbour pockets of fragility. If not managed well, these periods or pockets can spur a downward spiral of fragility and conflict, where states are locked into cycles of repeated violence, weak governance, and instability.

Managing these challenges begins with a clear understanding of the compound climate-fragility risks that emerge when climate change interacts with other social, economic, and environmental pressures, such as rapid urbanization, inequality, economic shocks, and environmental degradation.

1. Local resource competition

As the pressure on natural resources increases, competition can lead to instability and even violent conflict in the absence of effective dispute resolution.

Access to natural resources, particularly water and arable land, will be constrained in some regions due to climate change. At the same time, demand is increasing in areas with growing populations and rapid economic development. Together, these trends may spur competition over essential resources, increasing tensions and provoking local conflicts. Competition over resources is likely to be particularly disruptive in regions that rely on a narrow resource base, have a history of conflict, or are home to marginalized groups. Local competition can also trigger problems at the national and international levels. However, equitable and effective natural resource management can help reduce fragility and prevent the consequences of climate change, including increased competition over limited resources, from escalating into violence.

2. Livelihood insecurity and migration

Climate changes will increase the human insecurity of people who depend on natural resources for their livelihoods, which could push them to migrate or turn to illegal sources of income.

Many people who depend directly on natural resources will find their livelihoods endangered by climate change. In some areas, climate change will reduce grazing land, dry up water sources, and threaten jobs connected to climate-sensitive economic sectors. These environmental changes can combine with other problems—such as unequal land distribution, insecure land tenure, poorly developed markets, trade barriers, and inadequate infrastructure—to push populations

to seek alternative livelihoods. Some will move to urban areas that already suffer from high levels of unemployment and poor living conditions, while others may be forced to turn to more informal or illegal sources of income. Climate change will alter both existing migration patterns and the number of people likely to move. While migration can be an effective way to cope with climate stress, the increased movement of people driven by climate change impacts could, if migration and resettlement are poorly managed, lead to local and regional instability.

3. Extreme weather events and disasters

Extreme weather events and disasters will exacerbate fragility challenges and can increase people's vulnerability and grievances, especially in conflict-affected situations.

Extreme weather events and disasters endanger and destroy people's lives, livelihoods, assets, health, and communities. The relationship between disasters and fragility is often mutually reinforcing: Disasters put additional stress on already stretched governance systems, decrease economic opportunities, reduce resources, and displace people. A lack of safety nets, preparedness, insurance mechanisms, and other methods to cope with the impacts of disasters can fuel grievances, especially if government or international assistance is inadequate or inequitably distributed. Poorly designed humanitarian interventions can also exacerbate tensions and increase the risk of conflict. In addition, in fragile and conflict-affected situations, disasters can undermine or override efforts to bolster resilience, increasing the severity of the disaster's impact. Conversely, disaster risk reduction and effective disaster management efforts can provide opportunities to improve resilience to climate-fragility risks and build peace.

4. Volatile food prices and provision

Climate change is highly likely to disrupt food production in many regions, increasing prices and market volatility, and heightening the risk of protests, rioting, and civil conflict.

Climate change is highly likely to decrease yields and disrupt food production in many areas. Combined with increasing global pressures—including population growth and changing energy demands—food insecurity is likely to increase and food prices to become more volatile. As exemplified by the 2007–9 food riots in more than 40 countries, food price volatility and high prices can increase the risk of public unrest, democratic breakdown, and civil and local conflict, particularly when combined with poverty, poor governance, and a weak social contract. States that depend on food imports and where households spend a significant proportion of their income on food are particularly vulnerable. However, the likelihood that food insecurity contributes to instability depends not only on local factors, such as the degree of urbanization and market access, but also national policies, such as consumer subsidies and export markets.

5. Transboundary water management

Transboundary waters are frequently a source of tension; as demand grows and climate impacts affect availability and quality, competition over water use will likely increase the pressure on existing governance structures.

While the management of shared water supplies can provide opportunities for collaboration between stakeholders and governments, it can also be a source of tension. Many transboundary river basins are located in regions with a history of armed conflict and significant interstate tensions. Though, historically, armed conflicts between states over water are nearly unprecedented, the future may not look like the past. Competition over water use will likely increase as demand grows and climate impacts affect availability. Managing the effects of climate change on water resource use will be particularly complicated in transboundary basins affected by fragility or conflict, where water management is often eclipsed by political considerations or is affected by power asymmetries.

6. Sea-level rise and coastal degradation

Rising sea levels will threaten the viability of low-lying areas even before they are submerged, leading to social disruption, displacement, and migration, while disagreements over maritime boundaries and ocean resources may increase.

Rising sea levels already threaten the economic and physical viability of low-lying areas. Current estimates of sea-level rise suggest that no country will be entirely submerged during this century. However, as land and coastal resources are gradually lost, the economic viability of many coastal areas will significantly decrease, damage from cyclones and storm surges will become more severe, and the risk of future land and resource loss will become more pressing. These changes may displace people or push them to migrate, increasing the risk of tension and conflict in the receiving areas. As seas rise, changing coastlines may also alter border demarcations and trigger disputes over maritime boundaries, territorial seas, sea lanes, and ocean resources.

7. Unintended effects of climate policies

As climate adaptation and mitigation policies are more broadly implemented, the risks of unintended negative effects—particularly in fragile contexts—will also increase.

To reduce fragility and prevent conflict, we need effective climate change mitigation and adaptation policies. However, if designed and implemented without considering broader impacts, these well-intentioned climate change policies could undermine economic development, contribute to political instability, and exacerbate human insecurity. As climate adaptation and mitigation policies are more broadly implemented around the world, the risks of unintended negative effects—particularly in fragile contexts—will also increase. In fragile situations, the unintended consequences may include increased insecurity of land tenure, the marginalization of minority groups, increased environmental degradation and loss of biodiversity, and accelerated climate change. These unforeseen effects often arise due to a lack of cross-sectoral coordination and, in the case of fragile and conflict-affected situations, a lack of conflict-sensitive implementation of policies and programs.

These seven compound climate-fragility risks are not isolated from each other. They interact in complex ways, frustrating the development of effective responses at all levels. For example, transboundary water conflicts can disrupt local livelihoods and access to natural resources, while market instability and extreme weather events can have a negative impact on global supply chains, with serious local repercussions. At the same time, local natural resource conflicts and livelihood insecurity are primarily local challenges, but they can have significant knock-on effects—such as increased migration, economic disruption, or social tensions—that can spur instability both locally and across a wider area.

Climate change is simultaneously increasing the complexity of a range of global challenges, including fragility. If strategies to address these challenges fail to take into account the interdependent and systemic nature of these climate-fragility risks, they will fail or, in the worst case, exacerbate the risks they are trying to address. Interdependent challenges need integrated answers.

Policy Analysis: The Need for an Integrated Agenda

The best way to diminish the threats posed by the compound climate-fragility risks is to mitigate climate change. However, climate changes are already under way, so we must take steps to manage and minimize these risks today.

We identified three key policy sectors that help strengthen the resilience of states and societies to climate-fragility risks:

- CLIMATE CHANGE ADAPTATION programmes help countries anticipate the adverse effects of climate change and take action to prevent, minimize, and respond to its potential impacts.
- DEVELOPMENT AND HUMANITARIAN AID programmes help states and populations build their economic, governance, and social capacities and improve their resilience to shocks.
- PEACEBUILDING and conflict prevention programmes address the causes and effects of fragility and conflict by reducing tensions and creating an environment for sustainable peace.

The compound nature of climate-fragility risks means that single-sector interventions are not enough to prevent climate change impacts from exacerbating fragility or fragility from undermining climate resilience. By integrating efforts across the climate change adaptation, development and humanitarian aid, and peacebuilding sectors, the international community can mitigate the interconnected risks while realizing significant co-benefits.

Integrating efforts throughout key policy stages—early warning and assessment, planning, financing, and implementation—will be a complex, though essential, endeavour. We found a number of gaps in existing programmes that offer opportunities for developing a more cohesive policy agenda that can respond to climate-fragility risks.

Climate change adaptation

In countries experiencing situations of fragility, climate adaptation strategies may be important entry points for addressing climate-fragility risks since they offer pathways for responding to stresses on critical natural resources. To do this, however, these strategies need to be linked to long-term peacebuilding efforts.

The United Nations Framework Convention on Climate Change (UNFCCC) has been a key resource, helping countries prepare vulnerability assessments and climate change adaptation plans, as well as providing funding for the implementation of these plans. However, it can be challenging for countries experiencing situations of fragility to fully engage in UNFCCC-related activities. Climate vulnerability assessments are far more advanced today than just a few years ago, but they still lack significant discussion of the political or social impacts of climate change and information on a country's conflict history or its marginalized groups; in addition, most do not address drivers of fragility or other transboundary issues.

Climate change adaptation plans increasingly reflect a more comprehensive notion of resilience. Eight of the g7+ states—a voluntary association of conflict-affected countries that are in transition to the next stages of development and are part of the New Deal for Engagement in Fragile States—have recognized climate-conflict risks in their national adaptation programmes of action. Unfortunately, there is little guidance on how to prepare an adaptation planning process in fragile contexts or how to address the transboundary dimensions of climate change impacts. In addition, due to the

UNFCCC's state-oriented focus, adaptation programmes generally do not take a regional approach, which could be a way to address transboundary climate-fragility risks.

While financing for climate adaptation is expected to increase substantially in the coming years, countries with situations of fragility may be less well positioned to access these resources than other developing countries due to the limits of their internal capacity. Whereas the example of the Least Developed Countries Fund indicates that the g7+ countries are able to access some climate finance, access to more complex financing mechanisms, like the Adaptation Fund, has been limited.

Implementation efforts have gaps as well. Since adaptation efforts will have an impact on people's lives, livelihoods, asset base, and power dynamics, a 'do no harm' approach would require that climate adaptation interventions distribute benefits and resources in a conflict-sensitive way that does not aggravate tensions between communities. However, there is limited guidance on how to 'conflict-proof' climate adaptation programmes.

Development and humanitarian aid

The wide array of international development and humanitarian aid activities includes many processes that could be adjusted to better address the compound climate-fragility risks. Thus, the G7 governments are increasingly emphasizing holistic, integrated, and whole-of-government approaches in their development processes.

In the field of early warning, a number of current efforts could contribute to integrated assessments of climate-fragility risks. However, the implementation of these initiatives has been limited due to financial constraints and a lack of human capacity. In addition, many early warning systems do not include climate or environmental risks. Even though these challenges have not been addressed in a comprehensive fashion, the follow-up to the Hyogo Framework of Action and the recently adopted Sendai Framework for Disaster Risk Reduction offer chances to address these gaps.

The development community has made some progress in 'climate-proofing' development projects by mainstreaming climate considerations into some segments of its other sectoral development programming. Applying a 'climate lens' to planning and regulatory frameworks could help development and humanitarian aid programmers identify particularly vulnerable sectors and regions. In addition, support for integrated activities could help countries avoid overlooking opportunities to align their climate adaptation and national development or post-conflict recovery plans. However, this approach is not yet standard. The ongoing Sustainable Development Goals process could be a key entry point in this effort.

Countries that experience fragility often lack absorptive capacity, which can contribute to the volatility of development assistance levels. If left unaddressed, this volatility could undermine efforts to improve resilience to climate-fragility risks and build capacity. A flexible, harmonized, and integrated aid structure with a longer-term perspective could help address this problem.

It is widely accepted that implementers should engage local communities and institutions and civil society to build local ownership of development projects. By working together with local officials and leaders who have the confidence of their constituencies, implementers can strengthen governments' effectiveness and accountability. However, implementers working in fragile situations need to allow more time to deal with unanticipated security issues, new governments, or slow responses from executing agencies.

Peacebuilding

Climate-sensitive peacebuilding activities can be informed by lessons learned from environmental peacebuilding projects. Environmental and climate risks are not yet comprehensively integrated into peacebuilding methodologies, and the capacity of states experiencing fragility to transform climate-fragility risks into opportunities is limited.

While leading peacebuilding and security actors, including the UN Security Council, have called for a better understanding of the links between climate and fragility, climate change is not yet sufficiently incorporated explicitly into fragility or peace and conflict assessments. Though many different assessment tools focus attention on climate change, natural resources, or conflict, very few integrate all three dimensions.

Initiatives like the New Deal for Engagement in Fragile States take a multi-stakeholder approach to building resilience and are important conduits for partnering with vulnerable countries facing the greatest risks from fragility. Environmental and climate risks, however, are not prominently included in the fragility assessments and the Peacebuilding and Statebuilding Goals of the g7+ countries.

To avoid overwhelming the absorptive capacity of countries facing situations of fragility, a number of pooled funding mechanisms — multi-donor trust funds (MDTFs) — finance peacebuilding activities. However, the climate-fragility risks identified in this report are not systematically reflected in any of the MDTFs that focus on peacebuilding. Some include climate change considerations in their disaster funding requirements, while others address the role of natural resources in post-conflict contexts. Few financing instruments for peacebuilding and conflict prevention specifically earmark funds for programmes that address climate and fragility risks. As an alternative, funding instruments could require that all projects consider climate change impacts.

What are the key policy gaps?

To develop an integrated agenda, we do not need to reinvent the wheel, given the existing efforts. However, to break down the sectoral barriers that hamper efforts to address climate-fragility risks, a number of key policy and institutional gaps need to be addressed.

Early warning and assessment

While we do not know everything about climate-fragility risks, we already have a substantial amount of information about the links between climate change and fragility. By integrating existing efforts, we could improve early warning systems and assessments. Currently, these assessments often ignore other dimensions: Climate vulnerability assessments do not include transboundary issues or fragility considerations; and fragility, peace, and conflict assessments generally do not include climate change vulnerability or analyses of the co-benefits of climate change adaptation. Few assessment methodologies focus on both climate and fragility. And even when such assessments are conducted in a way that integrates attention to both issues, the findings are often not used effectively in planning or implementation.

Planning

While there are many strategies and plans to address climate change, development, humanitarian aid and peacebuilding, there is little integration. Comprehensive planning processes could avoid duplication, prevent maladaptation, and bolster sustainable development. For example, national climate adaptation strategies and implementation processes could enhance perceptions of political

legitimacy, if conducted transparently, inclusively, and equitably. In addition, such strategies could proactively identify and promote the co-benefits of effective climate adaptation, such as peace, health, and employment.

To date, however, there have been few examples of integrated planning approaches that incorporate conflict sensitivity and follow the 'do no harm' principle. And at the regional level, no political process systematically supports the development of integrated approaches to adaptation, development, and peacebuilding challenges.

In fragile situations, key institutions should be strengthened so they are able to manage competing interests constructively and peacefully. However, countries experiencing situations of fragility often lack the tools to identify and build the institutional capacity they need, which includes the ability to conduct integrated planning across relevant government departments and in consultation with stakeholders and civil society. For example, increasing awareness of a country's vulnerability to climate change and the benefits of investing in adaptation could be an entry point for building this capacity.

Financing

Financial support — especially longer-term financing — for states experiencing situations of fragility is challenging. Although the amount of global climate funding is expected to increase substantially, it is not yet clear to what extent these states will be able to benefit, due to their limited capacities. Financing — including private finance, development assistance, and peacebuilding funds — plays an important role in building institutional resilience and fostering peace. Unpredictable funding, a lack of donor coordination, weak institutions, and siloed agendas are key challenges for many countries but especially for those experiencing situations of fragility.

The global agendas on climate, sustainable development, peacebuilding, and other environmental issues are largely conducted through separate policy processes, fostering a proliferation of negotiation fora and sectoral funding streams, each with different operational procedures, fiduciary standards, and reporting requirements. This proliferation burdens already overstretched states with weak institutional capacity. Additionally, traditional aid delivery mechanisms are especially difficult for countries with weak institutions to manage.

Implementation

There are many pilot programmes, but there is little guidance on lessons learned and best practices to inform programme design and implementation. Adaptation, development, humanitarian, and peacebuilding programmes need to be built on a thorough understanding of climate-fragility risks, including the cross-sectoral integration of conflict-sensitivity and climate change considerations. As a first step, policymakers need to use a conflict-sensitive approach when implementing climate change adaptation measures and to include climate change considerations when designing peacebuilding strategies and projects. Unfortunately, there is very limited guidance on how to apply a 'conflict-sensitivity' check on climate change adaptation policies or projects. Similarly, there is little practical guidance on integrating climate-change considerations into peacebuilding policies and programs. Principles and best practices are essential at the policy level, and field-based guidance is especially needed at the project level.

In fragile and post-conflict contexts, social networks and institutional relationships are generally weak or have completely broken down. The results of the few integrated climate-fragility programmes that have been piloted in these contexts indicate that involving stakeholders in implementation is critical to success and to preventing maladaptation or unintended consequences.

Recommendations: A New Commitment for Resilience

The vicious cycle of climate change and fragility, which interact in ways that reduce the ability to improve outcomes, will not be broken by piecemeal reactions to individual crises. Instead, we need to build integrated, responsive systems that are resilient to a broad range of shocks and stresses. It is time for a new approach and new leadership from the highest level. We recommend that the G7 governments commit to designing and implementing integrated responses to climate-fragility risks.

We identified four recommendations including concrete goals and entry points at different levels:

1. Within the G7 member governments;
2. Coordination among the G7 members;
3. By informing global and multilateral processes; and
4. Working in partnership with a wide range of actors, including in countries affected by fragility.

Building on these four recommendations we propose five initial action areas for this new cooperative approach.

Recommendation 1

Integration begins at home: Make climate-fragility risks a central foreign policy priority

G7 governments are well placed to take the lead in identifying, understanding, monitoring, and addressing the climate-fragility risks described in this report. While a significant body of information about these risks already exists, an integrated approach is not implemented for four reasons: this information is not disseminated to the right people; integration is not mainstreamed; actions are not coordinated; and funding streams are not flexible enough to incentivize cross-sectoral outcomes. Translating this information into constructive policy action will be most effective if integrated responses to climate-fragility risks are mainstreamed into existing planning, implementation, and evaluation processes and indicators across government departments.

This effort requires developing capacities within government departments and creating cross-sectoral and inter-agency working groups and policy processes. Dedicated coordination units, for example, could help address these complex interconnected risks in an integrated manner. In particular, integrated risk analyses at the global, regional, and country levels could bring together different policy units and serve as a springboard for developing integrated responses. The development of common implementation guides, checklists, and trainings could also help build wide recognition of the risks and encourage integrated responses. Finally, bilateral aid agencies (where appropriate) could pilot integrated approaches — such as conflict-sensitive adaptation projects — to address the compound risks.

Recommendation 2

Come together for a new dialogue: Enhance G7 cooperation

Problems that do not respect national borders can best be addressed with concerted inter-governmental action. Their scale and scope require an injection of new energy in the short term, translated into sustained commitment in the longer term. The G7 is uniquely qualified to provide this leadership, because of its global status, the nature and breadth of its policy remit, and its shared commitment to these issues.

The G7 could begin with a strong political statement during the German G7 presidency, opening the way to an action-oriented task force of senior officials. The creation of this task force would jump-start closer coordination between G7 members, leading to shared accountability and facilitating concrete common actions, including:

- Mandating annual reviews of integrated policies and programmes
- Holding technical sessions on best practices and lessons learned
- Investing jointly in shared data sources and new research
- Identifying gaps and new opportunities for joint responses
- Jointly developing and using a global risk assessment methodology

Making this task force part of the annual G7 process would maintain its visibility and priority and thus provide the G7 governments with a regular opportunity to exhibit leadership and further advance these efforts. To collect and disseminate the annual reports, highlight best practices, and share new data sources, the G7 task force could build on the knowledge platform on climate and fragility risks commissioned by the G7, which can be found at www.newclimateforpeace.org .

Recommendation 3

Set the global resilience agenda: Inform multilateral processes and structures

The global strategic threat posed by climate change relates to a multitude of international processes in which the relationship between climate and fragility is currently treated as a marginal topic. The G7 governments have the collective weight to help break down the sectoral barriers and siloed approaches that have prevented many of these processes from addressing climate-fragility risks.

The G7 can help realize the co-benefits of integration by promoting greater coordination between climate, development, and peacebuilding processes. However, they must avoid overburdening governments, especially those in fragile situations, with duplicative planning and reporting requirements. An integrated response should lead to streamlining.

Multilateral institutions such as the World Bank and UN organizations should be encouraged to increase their focus on climate change and fragility, conduct integrated climate and fragility risk assessments, and develop operational guidance for climate-sensitive and conflict-sensitive policies and programmes. Multilateral efforts on the post-2015 agenda, the Sendai Framework, and climate change adaptation policies can be explicitly cross-referenced, focusing on synergies for planning, monitoring, or reporting among the different frameworks.

Those countries that are deeply affected by fragile situations will require additional assistance from multilateral processes to respond to climate-fragility risks. Coordinated international action would help these states prepare integrated climate change adaptation plans and implement climate resilience-building initiatives. Their own efforts will also benefit from less volatile and more evenly distributed funding, and from improved access to multilateral financing mechanisms for climate change adaptation, development, and peacebuilding.

Development partners should work together to improve the guidance for national adaptation planning through the relevant UNFCCC processes, and to ensure that countries experiencing situations of fragility are systematically supported. These countries would benefit from assistance in preparing integrated climate change adaptation plans that reflect relevant risks and from access to the Green Climate Fund and other relevant financing mechanisms.

Recommendation 4

Partner for resilience: Engage widely to ensure global actions produce local results

The G7 can also lead the way by improving coordination with partner states, local governments, and non-state actors. Too often, global initiatives have squandered their potential by assuming that global actions will trickle down to create local results. Strengthening links between partners and initiatives at the international, regional, national, and local levels will help ensure that global initiatives improve local resilience to climate-fragility risks.

This work can be led by the G7 task force and pursued in global fora such as the UN General Assembly; the World Economic Forum; UNFCCC meetings; the World Bank's Fragility, Conflict, and Violence Forum; Habitat III; and regional organizations. All these fora have a place in a new international discussion on climate change and fragility and in developing a new community of practice on climate-fragility risks and responses.

In particular, the G7 should reach out to national governments, local administrators, and NGOs in countries facing fragile situations, partnering with states that have endorsed the principles of the New Deal for Engagement in Fragile States. These partnerships can involve both financial support and technical training on issues such as addressing climate risks in fragility assessments, using fragility assessments to inform national adaptation plans, responding to environmental indicators and warnings, and improving risk assessment processes.

Five action areas: Make progress on five key tasks for building resilience against climate-fragility risks

Action Area 1

Global risk assessment

Governments carry out many different risk assessments, often of high quality, but these efforts are often disjointed and not coordinated within governments, let alone between them. The G7 governments, via the G7 task force, can establish a unified, shared, and accessible risk assessment methodology for identifying climate-fragility risks and generating actionable conclusions.

A whole-system approach to measuring compound climate-fragility risk would integrate four forecasting segments: greenhouse gas emissions; the climate systems' response; the knock-on consequences for society, economies, and politics, and the conflict and fragility risks that arise from them; and the consequences of actions taken to mitigate these risks. It will need to engage governments in the process of collecting and analysing these data. Actionable conclusions based on this evidence would be provided to individual governments, especially those at high risk or lacking their own capacity for compound risk assessment.

Action Area 2

Food security

This report highlights the need to understand the intersection between climate-related food insecurity, economic and social grievances, and marginalization, which can contribute to fragility and instability. Especially in countries afflicted by poverty, poor governance, and fragility, food insecurity can be explosive. In the long term, national governments will need to take the lead on improving their food policies, while donors can assist with building resilient food systems. But in the short term, we recommend five steps to mitigate the risks posed by food insecurity:

- Strengthen access to timely and accurate data and analysis to ensure a solid evidence base for policy decisions.

- Limit critical food price fluctuations by improving access to markets, reducing trade barriers, and enhancing market information.
- Ensure that adequate reserve food stocks are available to provide food security.
- During food price crises, keep markets operating both internationally and domestically.
- For longer-term resilience, enhance established strategies that promote the use of local supplies and boost local markets, including cross-border trading.

Action Area 3

Disaster risk reduction

The global humanitarian workload has increased and will likely continue to grow under the impact of climate change and climate-fragility risks. Although we have made significant progress in reducing disaster risks, we need to shift the emphasis of our efforts from managing crises to managing risks. Rather than hiking expenditures as crises erupt and cutting back when they pass, development partners should work together to consistently invest in crisis prevention. Investments in disaster risk reduction activities have been proven to reduce the cost of responding to disasters.

Integrating disaster risk reduction, peacebuilding, and climate change adaptation support for developing countries should be an explicit foreign policy goal of the G7 governments. In particular, the implementation of the newly adopted Sendai declaration and framework and of a new global climate agreement should be aligned with each other in order to realize synergies and avoid duplicating efforts.

The existing international architecture of disaster risk reduction is well developed. Supported by adequate and flexible human, natural, financial, and legal resources, its positive impacts could be further enhanced by linking existing structures more closely to comprehensive risk assessment and integrated strategies for development.

This includes, for example:

- Partnering with existing organizations, such as the World Bank or regional development banks, to develop operational guidance and lessons learned for climate-sensitive and conflict-sensitive disaster risk reduction policies and programs.
- Calling on existing sectoral organizations, such as the UN Office for Disaster Risk Reduction, to integrate climate-fragility considerations into their work.

Action Area 4

Transboundary water disputes settlement

Systematic engagement can help ensure that transboundary waters become points of peaceful cooperation rather than conflict. Diplomatic initiatives already in place could serve as starting points for establishing and reinforcing risk management and conflict resolution institutions before climate-induced water scarcity and volatility start to bite.

Three pillars of work are recommended:

- Strengthen existing local and national water management institutions.
- Improve cooperation on knowledge management, supporting the dissemination of good examples, best practices, and lessons learned. Experiences with existing legal arrangements may provide useful guidelines for approaching conflicts, while (joint) vulnerability assessments could be initiated to help build shared understanding of future challenges.
- Build on existing efforts to foster cooperation between governments in transboundary river basins. The G7 governments could convene a global conference on transboundary basins,

with a view to assessing how existing frameworks could be amended to secure greater buy-in. These frameworks should ensure that transboundary water management is systematically linked to climate adaptation and resilience, so those risks related to political challenges and hydrological changes can be addressed in an integrated fashion.

Action Area 5

Building local resilience to climate-fragility risks

The G7 governments can embed support for community resilience to climate-fragility risks throughout their aid programmes and use their influence in donor forums to encourage others to do the same. Building resilience to climate-fragility risks must be part of the thematic tone of development assistance, not an optional add-on kept separate from the main agenda. Adaptation to climate change and resilience to a range of threats can be fostered by a plethora of coordinated small-scale adaptation, development, humanitarian, and peacebuilding efforts. These actions work best with local entrepreneurship, engaged national leadership, and consistent international support.

Accordingly, local engagement and responsive governance must be at the heart of new national partnerships for resilience. Local actions require coordination and support in the form of training, equipment, information, and infrastructure, as well as support and direction from national governments. In situations of fragility and in other low-income countries, they require international financial and/or technical support.

This effort could include a wide range of initiatives, such as:

- Provide information on climate-fragility risks and pressures, help explore the range of traditional and modern methods to mitigate risk, and offer advice on available assistance.
- Help improve food security through investment in food systems and social protection mechanisms to mitigate the compound climate-fragility risks.
- Provide technical expertise and training on new practices, such as conflict-sensitive program design and management; climate-smart agriculture; climate-smart infrastructure; and improved water, energy, and ecosystem management.

The foundation for a more peaceful and more resilient future

These recommended actions will only be effective in tandem with joint efforts to reduce the emission of greenhouse gases. But even with an ambitious emissions agreement, climate-fragility risks will persist, so the preventive response must continue.

Responding to the global strategic threat posed by climate change is too great a task for any single government. This diverse set of recommendations outlines direct opportunities for the G7 member states—as well as for the G7 as a group, and in coordination with its international partners—to confront climate-fragility risks with integrated responses. Over time, the G7 governments and their partners may find that more explicit collaboration and more formal coordination through new arrangements and institutional structures could enable them to better capture synergies and achieve greater impact.

Climate impacts know no bounds. They cross all boundaries, whether of nation, sector, or agency. The G7 does not alone bear the responsibility to act on climate change and climate-fragility risks. But this year, the G7 has a singular opportunity to demonstrate its commitment to tackling climate change. The G7 foreign ministers can begin by articulating and acting on a new commitment to respond to one of the great challenges of our time: building resilience to climate-fragility risks.

1 Introduction

1.1 The G7's leadership on climate change and fragility

Climate change poses risks to global security, particularly in the world's fragile and conflict-affected areas. A growing number of high-level statements and reports—most notably, from the UN Security Council and G7 heads of state—have underlined the urgency of these risks. While development and security leaders have been the first to raise the alarm, foreign policymakers are joining the call for action.

"Climate change is a growing threat to peace and stability. This is why we need a new culture of cooperation. Affected states have to be engaged earlier, and resilience must become a leitmotif of foreign policy."
—**Frank-Walter Steinmeier,** Foreign Minister, Germany
April 2015

"Measured against the array of global threats that we face today—and there are many—terrorism, extremism, epidemics, poverty, nuclear proliferation—all challenges that know no borders—climate change absolutely ranks up there equal with all of them."
—**John Kerry,** US Secretary of State
December 2014

"Climate disruption is no longer a hypothesis, it's a certainty. Warming threatens peace and security."
—**François Hollande,** President of France
September 2014

"Climate change is one of the most serious threats facing the world today. It is not just a threat to the environment, but also to our national and global security, to poverty eradication and economic prosperity."
—Joint declaration by
David Cameron, Prime Minister and Leader of the Conservative Party;
Nick Clegg, Deputy Prime Minister and Leader of the Liberal Party;
Ed Miliband, Leader of the Opposition and Labour Party; United Kingdom
February 2015

The G7 member states have led the way in drawing attention to the potential security implications of climate change. On the basis of the G7's global status, policy remit, shared commitment, and ability to bring together seven of the largest economies in the world and their diplomatic services, it is uniquely positioned to leverage its members' leadership to create the political momentum necessary to comprehensively address climate change and fragility risks.

In April 2013, the G8 foreign ministers agreed to consider ways to better respond to the challenge of climate change and its associated risks. Later that year, officials of interested G8 countries met to discuss these issues and identify practical options for further consideration and action. They recommended that interested G8 members work together by conducting an independent study of climate change and fragility and by establishing an open, online platform to share and disseminate the collected knowledge and research. In early 2014, G7 members commissioned an international consortium—consisting of adelphi (lead), International Alert, the Woodrow Wilson Center, and the EU Institute for Security Studies—to conduct this study and develop the platform.

This report, *A New Climate for Peace: Taking Action on Climate and Fragility Risks*, is the product of a year-long effort by these organizations to assess the existing evidence and research on climate change's conflict and fragility risks, identify lessons learned from policies designed to address these risks, and offer recommendations for foreign policymakers on addressing this global strategic threat. The contents of this independent report and the online knowledge platform do not represent the opinion of the G7 or any of its member states.

1.2 What makes this report unique

Unlike the many previous reports on climate change and security, this report takes a broader look at fragility, viewing climate change impacts as pressures on states and societies that produce a wide range of fragility risks. It covers the whole spectrum of situations of fragility—ranging from crisis and violent conflict to volatile transitional stages, such as regime change, post-conflict situations, and political unrest. It reaches beyond the traditional focus on the weakest and most conflict-ridden states by calling attention to the risks posed by climate change for the stability and resilience of more developed countries.

This report is primarily aimed at foreign policymakers, who have only infrequently been the focus of research or the target of recommendations on climate's security implications. As such, this study is not an academic exercise; it aims to close the gap between climate-security analysis and foreign policy action by summarizing the scientific knowledge on this subject and by providing evidence-based recommendations. To this end, it analyses a broad spectrum of different policies, processes, and institutions in the fields of climate change, development, humanitarian aid, and peacebuilding, and it focuses on identifying gaps and challenges for integrated responses that cross sectoral silos.

In addition, an accompanying knowledge platform—www.newclimateforpeace.org—serves as a resource on climate change and fragility. It presents the main findings of this report, additional sources and information graphics, a blog, and an interactive mapping tool to access a conflict database that enables further exploration of the compound climate-fragility risks identified in this report.

1.3 Methodology

This report is based on a thorough review of the existing literature and scientific research. In addition to peer-reviewed research, the consortium also reviewed recent and unpublished research, reports and case studies, and field studies conducted by the consortium members. This effort was informed by a database on conflicts with environmental and climate dimensions, which will be published on the knowledge platform.

To fill gaps in the existing literature and test the results, the consortium conducted nine regional consultations, which brought together representatives of civil society, governments, the private sector, and academia. The participants identified regional and country-specific risks, policies, and lessons learned. The participants recommended ways that the G7 foreign ministries can help their countries mitigate the conflict and fragility risks posed by climate change.

Regional consultations were held in:

Ecuador · Egypt · Haiti · Jordan · Kenya · Morocco · Pakistan · Peru · Philippines · Samoa

This report uses case studies and narrative scenarios to illustrate climate and fragility risks and their complex interactions. The cases and scenarios, which draw on the best available analysis and scientific data, were selected based on geography, the availability of analysis and data, and the interests of the G7 partners. The scenarios are designed to explore plausible futures and challenge conventional thinking; they are not predictions (*Rüttinger and Maas 2010*). Each scenario offers a short analysis of the current situation and describes alternative pathways that outline risks and opportunities.

In addition, 102 foreign policy practitioners from Germany, France, Japan, the United States, and the European External Action Service based in 47 countries were surveyed on their perception of the risks analysed in this report and what role existing policy processes play in addressing these risks.[1] This survey will serve as a baseline for measuring future changes in risk perception. The same survey was submitted to 29 experts on climate change and fragility from 17 countries.[2] The results were compared to the responses from the foreign policymakers.

1.4 Structure of this report

The report has three main chapters. In Chapter 2, a global risk analysis identifies seven compound risks, which are illustrated by country-specific cases and forward-looking scenarios. A summary table defines each risk, lists potential tipping points, and offers entry points to address them. Both tipping and entry points are illustrative and not comprehensive.

Chapter 3 reviews policies in three fields—climate change, development cooperation and humanitarian aid, and peacebuilding—to identify the existing approaches, gaps, and lessons learned. Summary boxes outline key findings for four critical stages where integration is necessary.

Finally, Chapter 4 offers four recommendations for foreign policy, based on the risk and policy analyses. While aimed mainly at foreign policymakers, these recommendations also take into account the related policy fields of climate adaptation, peacebuilding, development cooperation, and humanitarian aid. Overall, the report finds that the complexity of the risks posed by climate change requires answers that span policy silos.

1 A total of 50 countries were selected from states in fragile situations and states that are particularly vulnerable to the impacts of climate change: 20 member states of the g7+ (Afghanistan, Burundi, Central African Republic, Chad, Comoros, Côte d'Ivoire, Democratic Republic of the Congo [DRC], Guinea, Guinea-Bissau, Haiti, Liberia, Papua New Guinea, São Tomé and Príncipe, Sierra Leone, the Solomon Islands, Somalia, South Sudan, Timor-Leste, Togo, and Yemen), the 20 states most vulnerable to climate change, on the basis of data from the ND-GAIN Index on Climate Vulnerability and the Maplecroft Climate Vulnerability Index (Bangladesh, Burkina Faso, Cambodia, Djibouti, Eritrea, Ethiopia, Gambia, India, Laos, Lesotho, Madagascar, Malawi, Mali, Mozambique, Nepal, Nigeria, the Philippines, Rwanda, Sudan, and Uganda), and 10 additional states with high climate and fragility risks that had been identified in the consortium's regional consultations and/or on the basis of the consortium's research (Colombia, Ecuador, Egypt, Indonesia, Jordan, Kenya, Morocco, Myanmar, Pakistan, and Peru). We did not receive responses from Chad, Ethiopia, São Tomé and Príncipe, Sudan, Timor-Leste, and Yemen, but we received additional responses from Gabon, Tanzania, and the United Arab Emirates.

2 These 17 countries are Burundi, Chad, Côte d'Ivoire, DRC, Ecuador, Ethiopia, Jordan, Kenya, Malawi, Morocco, Nepal, Nigeria, Pakistan, Peru, Somalia, Uganda, and Zimbabwe.

2 Compound Climate-Fragility Risks

2.1 Climate change and fragility

Climate change will be one of the major threats to the stability of states and societies in the decades to come.

Climate change will be one of the major threats to the stability of states and societies in the decades to come. The capacity of states and societies to manage change, including climate changes, can be measured along a spectrum of fragility, from most fragile to most resilient. A lack of legitimacy undermines a state's authority, accelerating the transition to a situation of fragility. Pockets and periods of fragility can exist within otherwise stable states. The sharpest risks arise when multiple pressures converge. As climate change interacts with other pressures and contextual factors, seven compound risks emerge: local resource competition, livelihood insecurity and migration, extreme weather events and disasters, volatile food prices and provision, transboundary water management, sea-level rise and coastal degradation, and unintended effects of climate policies.

Climate change is a threat multiplier

During the last decade, growing evidence has underlined the urgency and depth of the risks climate change impacts pose for security and peace. Most notably, the 2014 report of the Intergovernmental Panel on Climate Change (IPCC) states that 'human security will be progressively threatened as the climate changes'; the risk of violent conflict will increase by exacerbating well-documented conflict drivers, such as poverty and economic shocks (*IPCC 2014*).

Similarly, the United Nations Security Council has stated that 'possible adverse effects of climate change may, in the long run, aggravate certain existing threats to international peace and security', and the European Commission has identified climate change as a 'threat multiplier which exacerbates existing trends, tensions, and instability' (*UNSC 2011*; *European Commission 2008*).

As a threat multiplier, researchers have found that climate change drives a diverse set of 'secondary risks, such as violent conflict, political instability, population displacements, poverty, and hunger' (*Gemenne et al. 2014*; *CNA 2007*). In all these discussions, climate change is recognized as a variable that aggravates simultaneously occurring environmental, social, economic, and political pressures and stressors. There is no automatic link between climate change, fragility, and conflict; if and how climate change contributes to fragility depends on the context in which it occurs.

Climate change is not simply 'just another' variable, however. The consequences of current and previous carbon emissions will continue to unfold even as nations come together in Paris for the Conference of Parties in December 2015 to negotiate critical agreements to reduce greenhouse gases (GHGs) (*IPCC 2014*). Accordingly, the pressures of climate change identified by the United Nations, the European Union, and the IPCC will not only persist but will continue to increase over the coming decades. This built-in momentum guarantees that the impacts of climate change will also continue to threaten stability and security.

The sharpest fragility risks arise when climate change and other pressures converge

The combined pressures of climate change and other stressors can overburden states and societies. They push them towards fragility and can potentially lead to state collapse or violent conflict. This impact will be particularly strong in weak and conflict-affected states, where pressures are already high and the capacity to manage them is low (*IPCC 2014; Dabelko et al. 2013; Smith and Vivekananda 2009*). However, even seemingly stable states are at risk of being overburdened and can be pushed towards increased fragility if the pressure is high enough or the shock is too great. Thus, these climate-fragility risks are shared among a much larger group of countries than those widely understood to be fragile (*Carius et al. 2008; WBGU 2007*).

Pressures and shocks are expected to increase in the future

POPULATION GROWTH WILL GENERATE A HUGE DEMAND for public services and will pose significant challenges for increasing employment and reducing poverty (*World Economic Forum 2014; UNEP 2012a*). In addition, the pressure on natural resources will increase as demand rises, outpacing production efficiencies (*EEA 2010*). While estimates vary, the global population is likely to increase to 8.3 billion by 2030, as people live longer, fewer children die, and fertility rates in many developing countries remain high (*US National Intelligence Council 2012; UK MoD 2014*). Developing countries are likely to account for approximately 97 percent of global population growth by 2050. These soaring populations will impede efforts to combat poverty, particularly in places where environmental disasters and climate changes damage livelihoods. According to the 2013 Human Development Report, by 2050 the number of people living in extreme poverty in Sub-Saharan Africa could decline from 400 million to 225 million. However, if environmental pressures and disasters increase, the number of extremely poor people could rise to more than 1 billion in Sub-Saharan Africa and to 1.2 billion in South Asia (*UNDP 2013a*).

DEMOGRAPHIC IMBALANCES WILL INCREASE, especially in the Middle East, Central Asia, and Sub-Saharan Africa. The median age varies significantly between developing and developed countries; for example, it is 16 in Niger, Uganda, and Mali but is 45 in Germany and Japan (*Cincotta 2012*). A growing youth population could be a source of dynamism and contribute to economic growth. However, if economic opportunity is restricted, the 'youth bulge' can combine with existing political, social, and economic tensions—such as unemployment, rapid urbanization, declining economic conditions, and environmental changes—to increase the potential for conflict (*Beehner 2007; Cincotta 2011; Cincotta 2012; LaGraffe 2012; Yifu Lin 2012; Urdal 2012*). Today, the Middle East has the highest proportion of youths relative to adults in the region's history; more than 30 percent of the population is between 15 and 29 years of age (*Brookings Institution 2014*).

GENDER IMBALANCES OFTEN ACCOMPANY AGE IMBALANCES in urban youth populations, due to gender selection in rural-to-urban migration. In Sub-Saharan African cities, an increasing proportion of young males (15–24 years) in the adult male population often correlates with higher levels of social disorder (*Urdal and Hoelscher 2009*). In China, migration-induced gender imbalance is further compounded by high male-to-female sex ratios at birth due to sex-selective abortions spurred by the country's one-child policy (118 male children were born for every 100 female children in 2010). Some researchers argue that such high male-to-female sex ratios may increase the rates of violent crime, prostitution, human trafficking, and societal instability (*den Boer and Hudson 2014*).

On the other hand, many industrialized countries, particularly Japan and those in Western Europe, face very different challenges as their populations age. In the long term, aging populations might constrain economic growth, reduce military force readiness, and create political tensions between groups (*UK MoD 2014*).

URBANIZATION WILL CONTINUE TO INCREASE: Today, 50 percent of the world's population lives in cities. This share will increase to about 60 percent by 2030 and 70 percent by 2045 (*Lagarde 2014; UN-DESA 2014*). Cities generate 80 percent of the world's GDP (*UNEP 2013; World Bank 2014c; World Economic Forum 2014*). Population growth in urban centres will pressure governments to meet growing demand for jobs, housing, transportation, and health care, along with land, water, and energy (*UNEP 2012a*). Well-managed urban development could create opportunities for more economic growth and greater productivity. However, increased economic productivity can also increase the consumption of natural resources. Today, 863 million people live in slums around the world (*UN Habitat 2013*). In Africa, only 89 percent of the urban population has access to clean water and only 69 percent has electricity; a mere 28 percent of the roads are paved (*UN Habitat 2013*). Annual water demand in the world's largest cities is projected to increase by 80 billion cubic metres until 2025 (*Dobbs et al. 2012*). Urban spaces could require an additional 100 to 200 million hectares of land within the next 40 years (*UNEP 2012a; Bettencourt et al. 2007*). In some contexts, these needs will be almost impossible to meet.

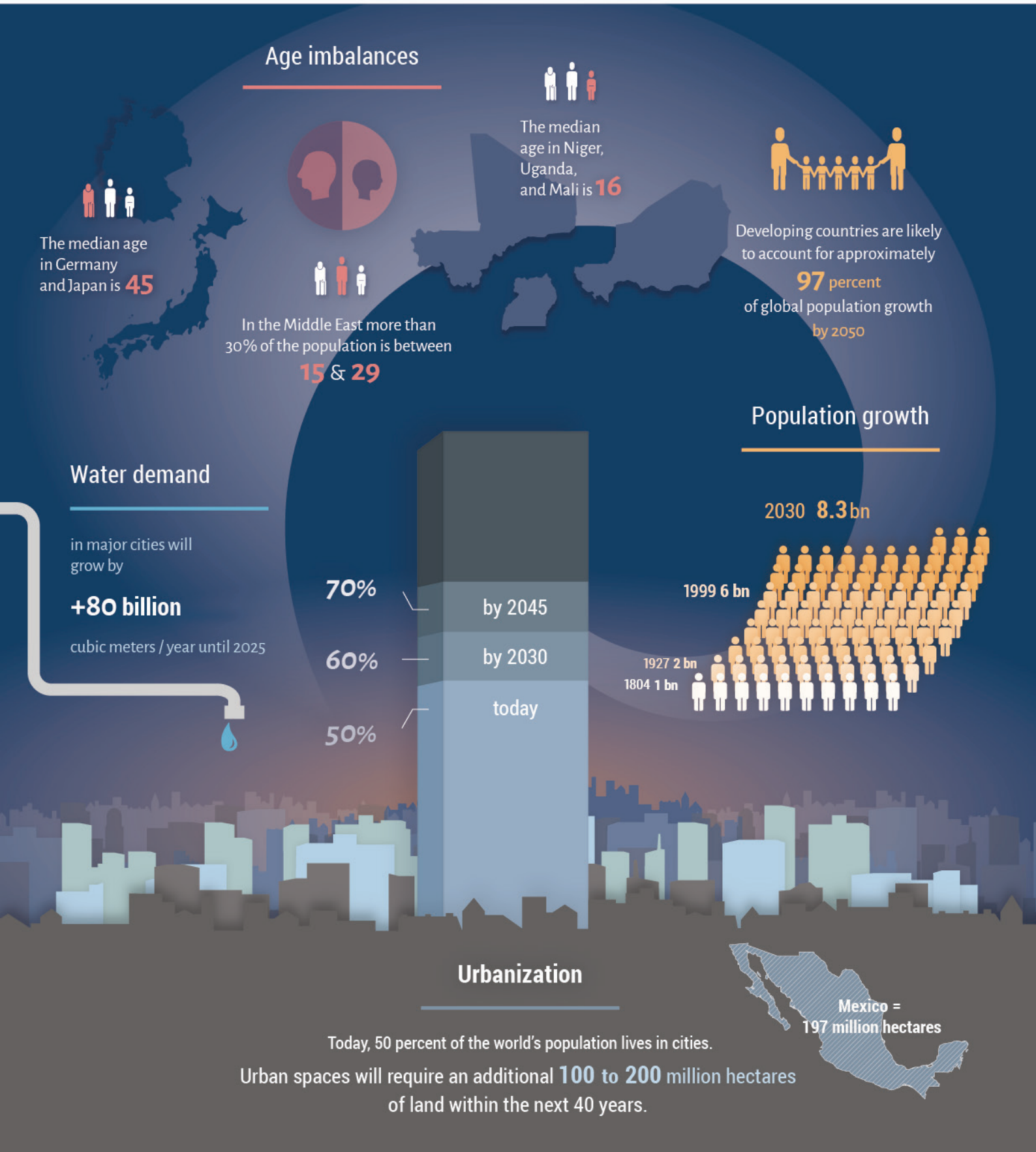
INEQUALITY WILL REMAIN A MAJOR CHALLENGE: More than 2.6 billion people, or a third of the world's population, live on less than US$2 a day. By 2018, half the world's poor will live in states identified as fragile by the OECD (*2013b*). Seventy percent of the world's population lives in countries where disparities between the rich and poor have grown in the last 30 years (*Lagarde 2014*). In a large majority of OECD countries, income inequality widened dramatically; the average household income of the richest 10 percent is now about nine times the household income of the poorest 10 percent (*World Economic Forum 2015*). Within emerging economies, income inequality could similarly increase if not managed properly. China, for example, has one of the highest levels of income inequality among countries with similar standards of living (*Xie and Zhou 2014*). While inequality in Latin America has declined during the last decade, it remains one of the most unequal regions in the world (*Tsounta and Osueke 2014*).

GLOBAL DEMAND FOR FOOD, WATER, AND ENERGY CONTINUES TO GROW: Driven by economic growth and an expanding consumer class, by 2030 global demand for food, water, and energy will grow, respectively, by approximately 35, 40, and 50 percent (*Kharas and Gertz 2010; UK MoD 2014; US NIC 2012*). By 2045, agriculture could consume 19 percent more water, and global demand for freshwater is likely to grow by 55 percent.

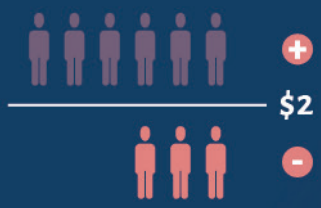
The magnitude of investment and reform needed to address this growing demand is daunting. Developing countries will need to invest US$209 billion by 2050 to keep up with the demand for food, roughly 50 percent more than current levels (*Lee et al. 2012*). The International Energy Agency (*2014*) estimates that by 2035 nearly US$48 trillion will need to be invested to meet the rising demand for energy.

RESOURCE STRESS AND ENVIRONMENTAL DEGRADATION WILL INCREASE: Twenty-five percent of the Earth's land is already degraded (*UK MoD 2014*). Due to land degradation, global food production is expected to decrease by 12 percent by 2040, and available cropland is expected to decrease by 8–20 percent by 2050 (*UNCCD 2014b; UK MoD 2014; Nellemann et al. 2009*). The current rate of biodiversity loss is estimated to be 1,000 to 10,000 times higher than the natural extinction rate, thus decreasing the ability of ecosystems to provide essential goods and services (*WWF 2012; Millennium Ecosystem Assessment 2005*).

Pressures and shocks are expected to increase in the future



Inequality

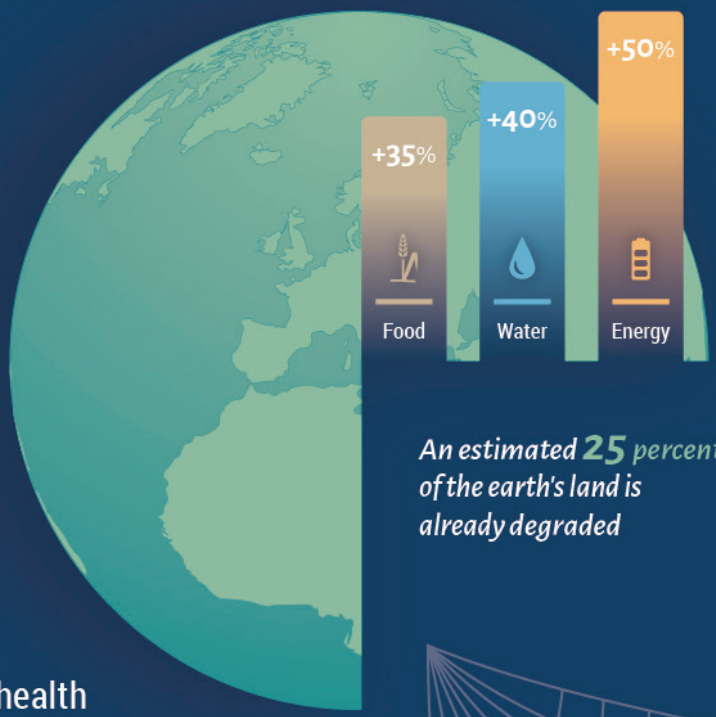


More than **2.6 billion** people, or a third of the world's population, live on **less than $2** a day.

By 2018, **half of the world's poor** will live in **states** identified as **fragile** by the OECD.

Global resource demand

growth by 2030



Developing countries will need to invest US$ **209** billion by 2050 to meet food demand, 50 percent more than today

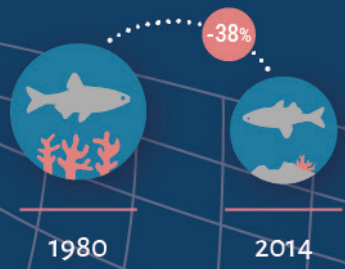
Nearly US$ **48** trillion is needed by 2035 to meet energy demand

*An estimated **25** percent of the earth's land is already degraded*

Ecosystem health

Biodiversity is **decreasing 1,000 to 10,000 times** faster than the natural extinction rate

Fisheries & coral reefs



coral reefs have declined **38%** since 1980

90% of the world's fish stocks are overexploited

Sources: Cincotta (2012); Kharas and Gertz (2010); Lagarde (2014); Lee et al. (2012); OECD (2013b); The International Energy Agency (2014); UN-DESA (2014); UK MoD (2014); US NIC (2012).

© adelphi

By 2011, 61 percent of the world's fish stocks were fully exploited and 29 percent were overfished (*FAO 2014b*). Warmer water temperatures and ocean acidification have bleached coral reefs, which have declined by 38 percent globally since 1980 (*UNEP 2012a*). Worldwide, the groundwater supply is threatened by pollution, oil and gas extraction, mining, waste and wastewater treatment, and other industrial sources (*UNEP 2012a*). The salinization of aquifers, particularly in low-lying coastal areas, is a serious problem, especially where it threatens drinking water. About 2 million tons of sewage and industrial and agricultural waste are discharged daily into waters around the world (*Pacific Institute 2010*).

The planetary boundary of climate change has been crossed

Given the atmospheric carbon dioxide concentration of almost 400 parts per million, climate change has now become the major threat of the 21st century. It has already affected agriculture, human health, ecosystems on land and oceans, water supplies, and livelihoods. As the IPCC (*2014*) states, these observed impacts 'are occurring from the tropics to the poles, from small islands to large continents, and from the wealthiest countries to the poorest'.

Water availability

WATER INSECURITY: The water security of about 80 percent of the world's population is already seriously threatened. For each 1 °C of global warming, 7 percent of the global population will lose at least 20 percent of its renewable water resources. Climate changes may increase renewable water resources in some regions. However, even those areas might experience short-term shortages due to increasingly variable rainfall and reduced snowfall and ice (*IPCC 2014*).

RAINFALL: During the 21st century, heavy rainfalls are likely to become more intense and more frequent. Consequently, soil erosion may intensify, even though total rainfall may not increase (*IPCC 2014*).

GLACIAL MELTING AND RUNOFF: On average, annual glacial runoff is projected to increase in high latitudes and the wet tropics and to decrease in most dry tropical regions. The magnitude and direction of specific changes are highly uncertain in parts of China, South Asia, and South America. There has been little research to date on the impacts of glacial melting on water, food, and energy security (*IPCC 2014*).

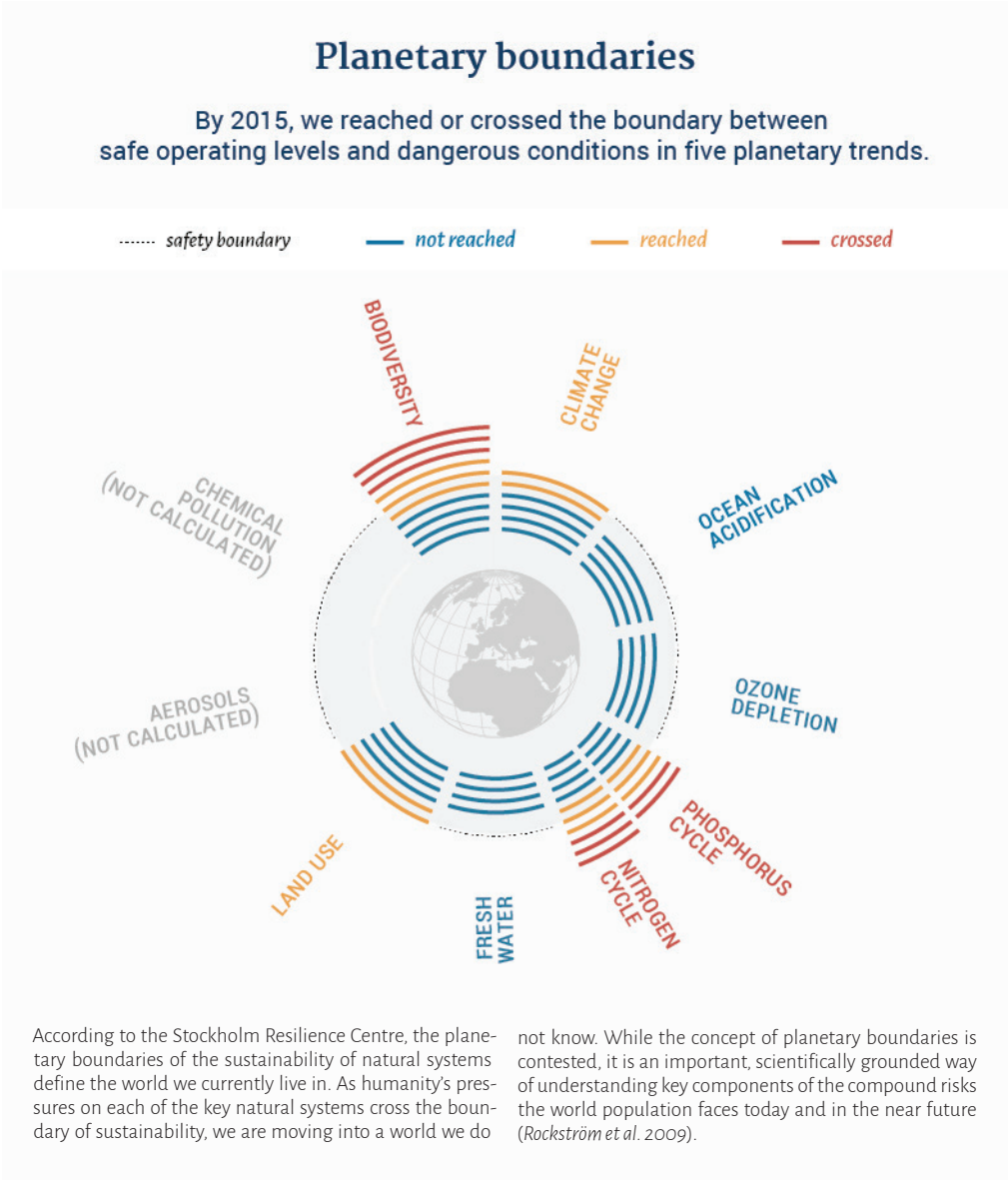
Food security

DECLINING AGRICULTURAL PRODUCTION: Climate change will reduce yields of major crops (wheat, rice, and maize) in tropical and temperate regions when the local temperature increases by 2 °C or more. Some regions, particularly northern latitudes, may become more productive due to climate change. The risk of more severe impacts increases after 2050, when crop production will be consistently and negatively affected by climate change in low-latitude countries (*IPCC 2014*).

INCREASING FOOD PRICES: In recent years, climate extremes in key producing regions have spurred rapid food price increases (*IPCC 2014*). By 2050, changes in temperature and precipitation could increase food prices by 3–84 percent (*IPCC 2014*).

LACK OF ACCESS TO FOOD: Low-income countries that depend on agriculture and import more food than they produce could experience significant increases in food insecurity, as domestic agricultural production declines and global food prices increase (*IPCC 2014*).

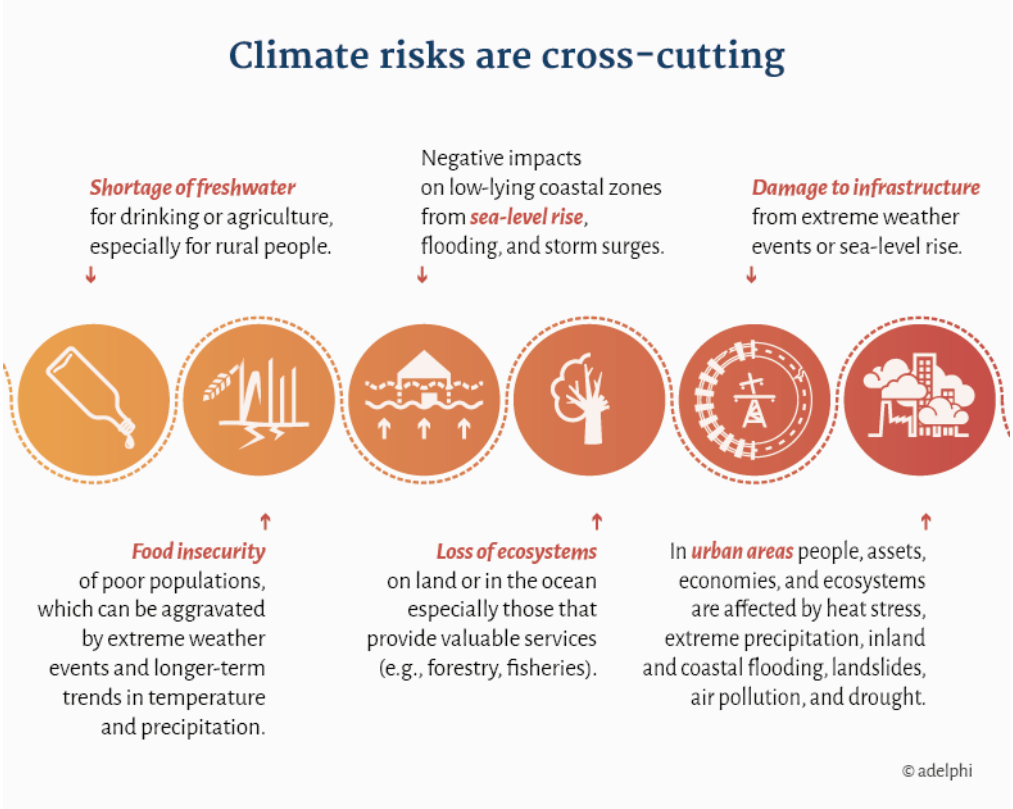
DECREASING FISHERIES: Changes in water use, including diverting more water and building more dams to meet increasing demand, will degrade inland and ocean fisheries and impede aquaculture (*Ficke et al. 2007; FAO 2009; Schröder 2013; IPCC 2014*).



› Adapted from Steffen et al. (2015)

Extreme weather events and sea-level rise

FLOODS AND DROUGHTS: The frequency and magnitude of both floods and droughts is projected to change: Over half of the globe will experience an increase in flood hazards, particularly in central and eastern Siberia, parts of Southeast and South Asia, tropical Africa, and northern South America. However, floods will decline in parts of Northern and Eastern Europe, Anatolia, Central and East Asia, central North America, and southern South America. At the same time, there will be more intense droughts in Southern Europe and the Mediterranean region, Central Europe, central and southern North America, Central America, northeastern Brazil, and southern Africa. This will strain water supply systems (*IPCC 2014*).



› **Sources:** UN-Water (2007); IPCC (2014); WFP and Met Office (2012)

SEA-LEVEL RISE: Sea-level rise poses a significant threat to coastal systems and low-lying areas around the globe by eroding coastlines and contaminating freshwater and crops (*Nicholls and Cazenave 2010*). Sea levels are projected to increase by at least 0.36 metres in a 1.5 °C world, and by 0.58 metres in a 4 °C world by 2100 (*IPCC 2014*).

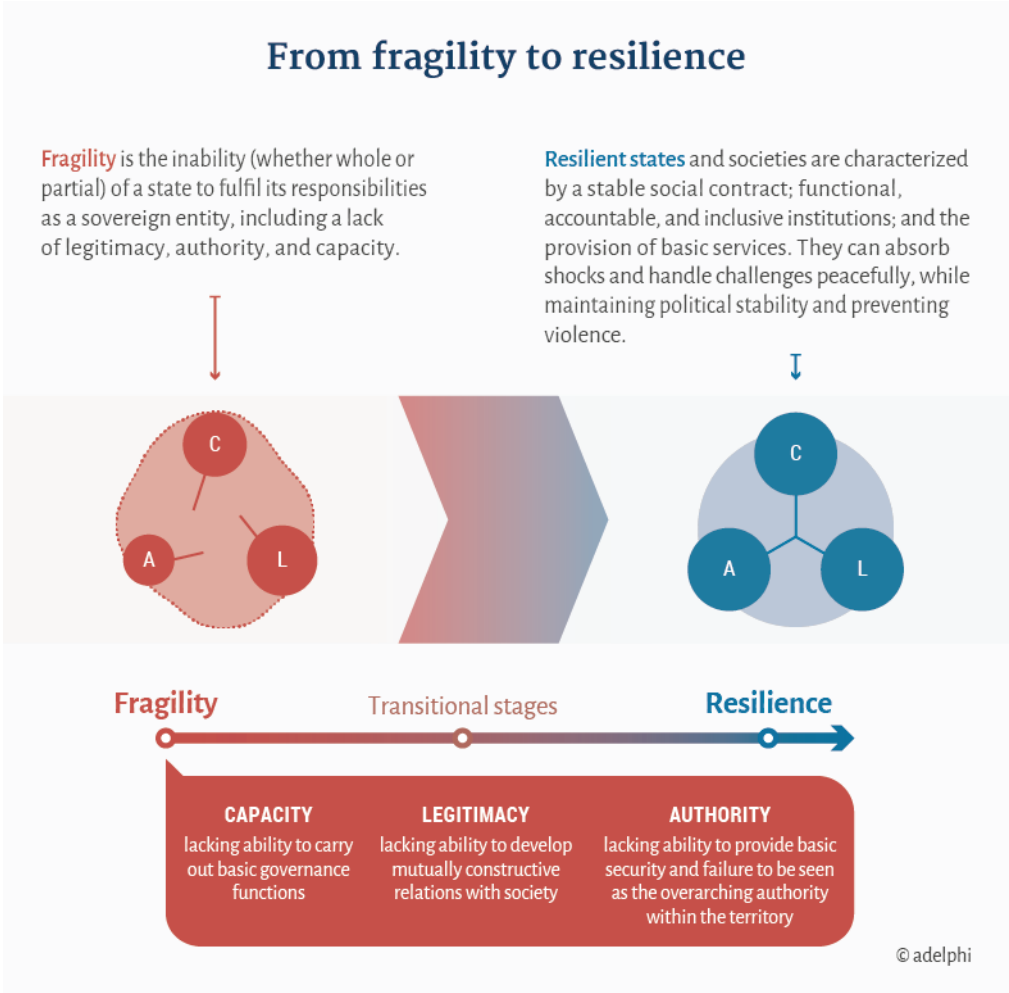
From fragility to resilience

Will states and societies be able to manage these pressures and shocks—especially as climate change accelerates them—or will they fail to respond adequately and trigger frustration, tension, and violent conflict?

The ability of states and societies to manage change and transform themselves occurs along a spectrum of fragility that runs from most fragile to most resilient (*g7+ 2013*). This broad and dynamic understanding of fragility is based on the quality of state-society relations and the potential stress factors, including economic vulnerability, demographic dynamics, and climate change.

At the positive end of the spectrum, resilient states are characterized by a stable social contract; functional, accountable, and inclusive institutions; and the provision of basic services. More importantly, resilient states and societies can absorb shocks and handle challenges peacefully, while maintaining political stability and preventing violence (*OECD 2013b*).

Fragility increases as we move towards the negative end of the spectrum (*OECD 2008a*). A wide number of different terms can describe fragile situations, such as 'weak states', 'failing or failed states', 'poorly performing states', or 'collapsed states'. Each of these terms raises a range of objections. Some mask unstated assumptions about a state's capabilities and role. Others offer a static picture of the difficulties faced by a state and its citizens, implicitly precluding the possibility of addressing those problems (*Stepputat and Engberg-Pedersen 2008; Faria 2011*).



› **Sources:** OECD (2013b; 2008a); Bellina et al. (2009)

Though the term 'fragility' also has limitations, it offers a useful rubric for considering a range or spectrum of related governance problems. Fragility is the inability (whether whole or partial) of a state to fulfil its responsibilities as a sovereign entity, including a lack of legitimacy, authority, and capacity to provide basic services and protect its citizens (*Carment et al. 2007; Teskey et al. 2012; Stepputat and Engberg-Pedersen 2008*). Thus, in a situation of fragility, the state lacks basic governance functions and the ability to develop mutually constructive relations with society (*OECD 2013b*).

A lack of legitimacy undermines state authority and capacity, accelerating the transition to fragility

A government's legitimacy decreases if it does not meet the expectations of its population, such as when it is unable to manage social needs and expectations through political processes, or its institutions are not inclusive and accountable and certain groups are socially and politically marginalized (*OECD 2008a; Bellina et al. 2009*). These failures can spur frustration with a society's ruling authorities. The risk of civil unrest and conflict increases as the state's legitimacy decreases (*Kaplan 2009*).

Conflict and deprivation may weaken social cohesion, thus eroding the basis for a strong social contract and increasing the risk of fragility (*Hilker 2012*). The social contract is defined as the way in which conflicting expectations of the state and the citizens are reconciled (*OECD 2008a*). If the social contract is resilient, the state and its institutions are viewed as the best way to meet people's expectations and needs (*Bellina et al. 2009*).

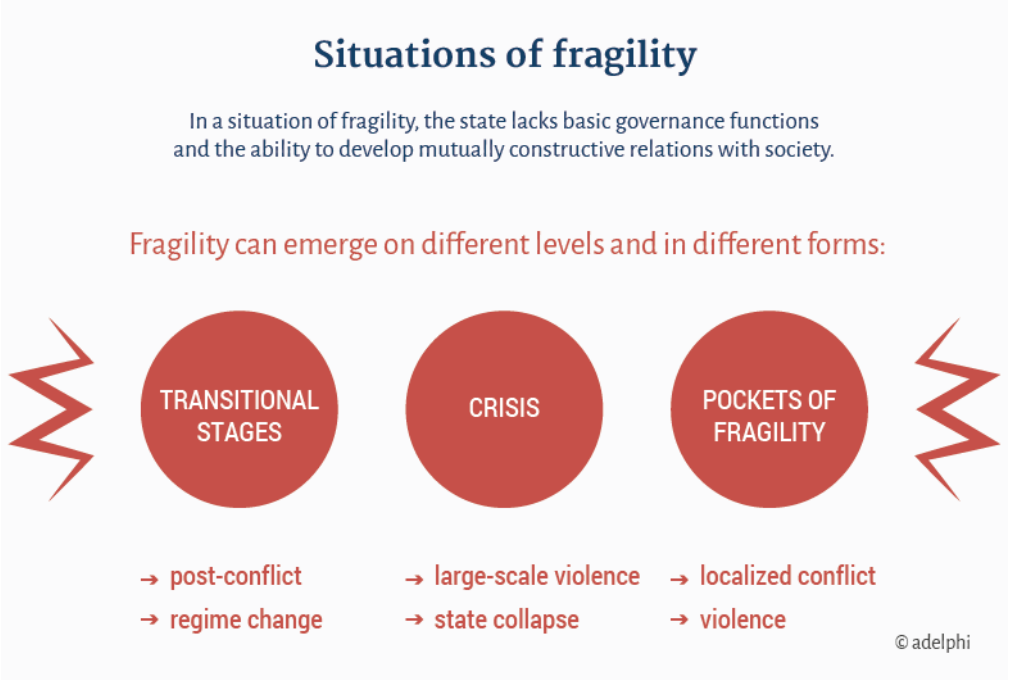
Authoritarian states usually lack legitimacy and frequently oppress segments of their population. They appear stable because they often have strong state institutions that allow them to exert high levels of control and use tax revenues and resource rents to buy legitimacy. However, the lack of legitimacy makes them inherently fragile. Even seemingly small events or pressures can trigger a rapid descent into fragility, as could be seen during the Arab Spring (*Gerschewski 2013; Abulof 2015; OECD 2008a*).

Fragility manifests itself in different forms and degrees

Fragility manifests itself in various forms and to varying degrees. Countries experience different situations of fragility. When a state is not able to manage pressures and shocks, and it lacks basic governance functions and the ability to develop mutually constructive relations with society, it could descend into crisis, such as violent conflict, or instead it may experience political instability, such as civil unrest or regime change. These situations of fragility can emerge on the local, national, regional, and global levels (*Rocha Menocal and Othieno 2008; ADB 2012*). This report covers the whole spectrum and all levels of situations of fragility, including intra-state and transboundary conflicts.

Pockets of fragility can threaten countries that may otherwise be stable

Even within stable countries, one can find pockets of fragility, such as dangerous urban areas (e.g., the favelas of Brazil) or remote rural areas (e.g., the border towns of Mexico or Colombia). These pockets of fragility emerge when a state abdicates its responsibility for a particular group (often poor or marginalized) or loses its control over a region of the country, leaving a power vacuum for criminal gangs or insurgent militias to fill. These pockets of fragility are not only made possible by weak state governance but also feed it, exacerbating long-standing inequalities and simmering tensions within societies. They can thus steadily diminish the national government's ability to reassert stability and possibly spread from the specific pocket to the entire country (*OECD 2013b*).



› **Sources:** OECD (2013b; 2008a); AfDB (2014a)

States and societies can enter a downward spiral of fragility

States can move between different stages or situations of fragility—sometimes very quickly. When states descend into large-scale conflict, they are often locked into cycles of repeated violence, weak governance, and instability (*Smith and Vivekananda 2009*). Ninety percent of civil wars in the last decade occurred in countries that had already endured civil war in the previous 30 years. Fifty percent of post-conflict countries relapse into conflict within 10 years (*UN Development Group and World Bank 2007*).

A similar positive feedback loop emerges between fragility and climate change. States and societies experiencing fragility have less adaptive capacity to climate change. This capacity shortfall makes them more vulnerable and increases the impact of climate change. These additional pressures can push a state and society further into fragility (*Houghton 2012*; *Adger et al. 2014*).

As states emerge from conflict or undergo political transformation, they can break the cycles of vulnerability, violence, and fragility by restoring confidence in their leadership and transforming institutions. States in this transition from fragility to resilience have the 'capacity for self-sustained growth, but continue to display broad weaknesses in the institutional and human capacity needed to deliver essential public goods and services' (*ADB 2012*).

This report avoids the problematic term 'fragile state' and refers to specific situations or contexts of fragility, such as post-conflict situations, and the specific levels at which they occur. It uses the term 'fragile area' for distinct geographic areas that experience situations of fragility and 'pockets of fragility' for a fragile area within an otherwise stable state.

The relentless impacts of climate change and fragility combine to produce seven compound risks

Building on two key assumptions—one, that some of climate change's impacts are unstoppable; and two, that some states and societies facing its foreseeable impacts are experiencing fragility—we identify seven compound risks that emerge as climate change interacts with other pressures: local resource competition, livelihood insecurity and migration, extreme weather events and disasters, volatile food prices and provision, transboundary water management, sea-level rise and coastal degradation, and unintended effects of climate policies.

To select these risks, we analysed:

- State-of-the-art research on climate change, fragility, and conflict: Our analysis encompassed both peer-reviewed research, as well as more recent grey literature, field research, and results from consultations held as part of this research project.
- The threats these risks pose to human, national, and international security.
- Their relevance and importance for foreign policymakers.

Some states and societies will prove to be resilient to the most extreme climate change effects, while others will verge on collapse after a much smaller impact. Therefore, the risk assessment does not depend on the magnitude of the climate change impact. Instead, the assessment begins with the fragility context.

Each of the compound risks is analysed in detail to identify the pressures and shocks engendered by climate change, and how these pressures and shocks can exacerbate or lead to fragility. First-order effects of climate change, such as storms and floods, are discussed together with second-order effects, such as migration and the displacement of people. Select studies illustrate how these compound risks are playing out today within specific countries or situations.

Forward-looking scenarios demonstrate how these risks might unfold in the future and challenge conventional thinking.

The first four compound risks—local resource conflicts, livelihood insecurity and migration, extreme weather events and disasters, volatile food prices and provision—describe risks that are clearly observable today. The other three compound risks—transboundary water management, sea-level rise and coastal degradation, and unintended effects of climate policies—are not as clearly observable today. While they can already be identified, the evidence base of past examples is weaker. Although the signal might still be weak and the analysis is more exploratory, there is a high likelihood that these risks will increase over the coming decades.

2.2 Local resource competition

As the pressure on natural resources increases, competition can lead to instability and even violent conflict in the absence of effective dispute resolution.

Access to natural resources, particularly water and arable land, will be constrained in some regions due to climate change. At the same time, demand is increasing in areas with growing populations and rapid economic development. Fragility may become more entrenched as people pursue strategies that increase competition between groups, disrupt other groups, and provoke conflict. The risk of conflict will increase if the changes in resource supply and demand intersect with other factors, including dysfunctional resource management, overreliance on a narrow resource base, a history of conflict, or marginalized populations. Local competition can also trigger problems at the national and international levels.

LOCAL RESOURCE COMPETITION	
What is the risk?	As climate change constrains access to natural resources in some regions, competition to secure them will increase. This competition can produce new tensions, increase fragility, and even escalate into conflict, particularly if resource management institutions and processes to resolve disputes are illegitimate or weak. Conflicts can take the form of clashes within communities or wider quarrels between user groups, and can even contribute to large-scale violence.
Tipping points	• Natural resource management systems in an already resource-stressed area break down. • Climate change has a significant negative impact on natural resources in a region or country with a history of resource conflicts.
Entry points	• Ensure that bilateral and multilateral development cooperation focuses on improving natural resource management systems and building local resilience. • Establish coherent and inclusive dispute resolution mechanisms to handle land and water issues within and between countries. • Support economic development and diversification to reduce dependence on narrow and threatened resource bases. • Ensure that resource security issues are factored into risk assessments and development planning.

Local resource scarcities and supply disruptions are likely to become more common

Climate change will have a negative impact on access to natural resources, such as land, water, timber, and extractive resources in many regions (*IPCC 2014*). At the same time, both demand for these resources and pressures from pollution and environmental degradation will continue to increase. Combined, these trends will increase local competition over essential resources, and along with it, the risk of fragility and conflict (*Ratner et al. 2014*).

Water supplies in particular will be affected by changing rainfall patterns, changing flows in glacier-fed rivers, the salinization of coastal aquifers, and shifting seasons. The effects will be felt most strongly in areas where demand is also increasing due to growing populations and rapid economic development. Scarcity of arable land will be driven by changing water supplies, along with a loss of farmland to other purposes (e.g., biofuels, urban growth) (*IPCC 2014; UNCCD 2014b*).

In addition, where land degrades, carbon embedded in the soil will be released into the atmosphere. The loss of biodiversity substantially reduces soil's potential to sequester carbon. Climate change and land degradation can thus combine to form a feedback loop that results in higher GHG emissions and accelerates climate change (*UNCCD 2014a; WMO 2005*).

Increased pressure leads to increased competition

As the pressure on natural resources increases, access to and control over them becomes increasingly valuable. States that are more resilient are more likely to manage changing resource availability and increased competition.

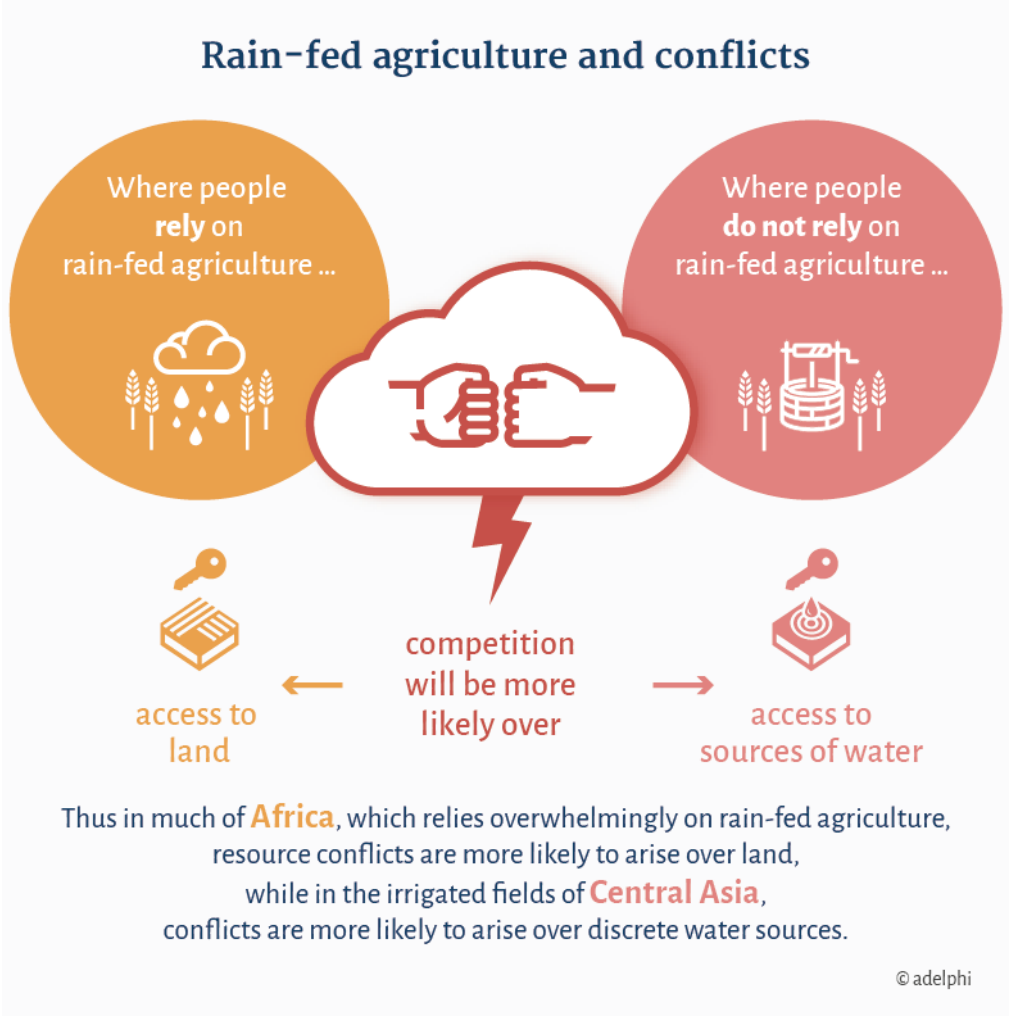
Where people rely on rain-fed agriculture and vegetation for grazing their animals, they are more likely to compete for land. Where rain-fed agriculture is less common, they are more likely to compete over access to sources of water for irrigation and other uses. In much of Africa, which relies overwhelmingly on rain-fed agriculture, resource conflicts are more likely to break out over land, while in the irrigated fields of Central Asia, conflicts are more likely to arise over discrete water sources (*International Crisis Group 2014a; International Crisis Group 2014b; Stanfield et al. 2013*).

Local resource conflicts can develop within communities, such as between members of a village fighting over a well, or between different user groups—such as farmers, households, industries, miners, and developers—all competing over the same water supplies (*Rüttinger et al. 2011a*). It is generally easier to identify the connections between resources, conflict, and fragility at the intrastate than at the interstate level—and these conflicts have proven more likely to lead to violence at the community level (*Wolf 1999*).

Equitable and effective natural resource management reduces climate–fragility risks

Where state and other institutions are able to equitably manage natural resources, scarcity and competition are less likely to lead to situations of fragility and violence (*Rüttinger et al. 2011a*). However, resource management that is weak, unfair, or absent can impair access to resources, further marginalizing certain groups. Women, for example, are often excluded from decision-making, and in many countries their access to resources is less secure, making them more vulnerable to the effects of climate change (*UNEP et al. 2014*).

Even in countries without robust and enforced water management systems, powerful water users can override the rights of local communities. If institutions allocate water inequitably between social groups, the risk of public protest and conflict increases. Formal water management systems can also contradict traditional practices. In the Achamayo River basin in Peru, for example, peasants cite historical accounts to claim territorial and water rights that conflict with the state's water licensing system (*Boelens et al. 2010*). Even where these situations do not result in conflict, they may feed existing tensions and exacerbate fragility.



› **Sources:** International Crisis Group (2014a; 2014b); Stanfield et al. (2013)

Natural resource competition can lead to community-level clashes and widespread tensions, and can even contribute to large-scale violence and civil war

Conflict is more likely if existing management systems are unable to manage environmental change and the adaptive responses, especially on the sub-national level (*Houdret 2008*). But while community-level resource decisions can instigate local clashes, national-level decisions can also lead to widespread tensions over policy shifts and resource allocation (*AfDB 2014b*). In the worst case, natural resource conflicts can contribute to large-scale violence or civil war. For example, customary land issues played a major role in all but three of the more than 30 intrastate conflicts in Africa between 1990 and 2009 (*Alden Wily 2009*).

Competition over resources is likely to be particularly disruptive in fragile contexts

In fragile situations, where governance structures are often incapable of managing climate-related scarcities and adjudicating competition over limited resources, the authorities may find it difficult to maintain legitimacy. For example, in Afghanistan, a 2008 Oxfam survey indicated that disputes over water and land were the two most common reasons for violent conflict at the community level

(*Waldman 2008*). Even though land values in Afghanistan increased rapidly after 2001, a lack of clear land titles impeded development in many areas, and anti-government insurgents managed to weaken both traditional structures and the government's ability to resolve land conflicts, exacerbating the likelihood of continued local conflict over land. With rapid population growth, limited productive land, and increased climate variability, the government will likely continue to struggle to manage local resource conflicts in a way that could help it earn legitimacy (*Niazi 2013*).

Resource scarcity can combine with pressures on livelihoods and food insecurity to entrench fragility and exacerbate vulnerability to disasters in fragile contexts. In Haiti, which is likely to be strongly affected by climate change impacts, almost total deforestation has eroded the soil in many areas and increased the danger of flash flooding (*USAID 2010*). But reforestation projects have failed, as subsistence farmers compete with loggers supplying wood and charcoal to urban centres for land. Immense distrust of large-scale agricultural projects and insecure land tenure for most small farmers has further entrenched fragility (*Johnson Williams 2011*).

But local resource competition can also be acute in 'pockets of fragility'

Even within relatively stable countries, resource competition can lead to conflict or increased fragility in some areas, particularly where there is a power imbalance between groups or a perception of marginalization. In India, rising water demand has increased competition and conflict in multiple states, a major worry for a country running short on groundwater and threatened by changing monsoons. In the Vadali village of Gujarat, for example, landless members of lower caste groups were forced to buy water from rich farmers who had boycotted the construction of a village well to

Risk factors around natural resources

Whether increased competition over natural resources escalates into conflict depends on a number of risk factors:

High dependence

Groups that are highly dependent on specific supplies of natural resources and lack alternatives may be more likely to pursue coping strategies that could spur conflict.

A history of conflict & fragility

Civil war, ethnic rivalries, and interstate conflict often establish a culture of violence, weaken cooperative mechanisms, and make arms easily available.

Inequality & marginalization

Imbalances in power and rights can lead to differences in access to resources, which can entrench poverty and inequality. Inequality, or the perception of it, can spur conflict between 'haves' and the 'have-nots'. Marginalized groups are often excluded from formal methods of resolving resource conflicts.

© adelphi

› **Sources:** Rüttinger et al. (2011a); AfDB (2014b); FAO (2000)

protect the water table for their livestock (*Prakash and Sama 2006*). Even where marginalized groups are protected by laws and official institutions manage water disagreements, a power differential can still lead to unequal outcomes and violence. On the outskirts of Pimpri-Chinchwad municipality in Maharashtra, a planned pipeline from the Pavana reservoir to the city bypassed 72 villages. Fearing the pipeline would reduce their water supply, villagers protested in August 2011 and three people were killed by the police (*Sandbhor 2014*).

Local conflicts over extractives in a changing climate

Conflicts over extractive resources in many resource-rich countries are currently a major challenge. If managed well, extractive revenues can be a source of transformative change (*AfDB 2014b*). However, the large social and environmental impacts of mining are often a source of grievances, with conflicts arising over the distribution of benefits and costs associated with resource extraction (*Wilson and Blackmore 2013; Tänzler and Westerkamp 2010*). Looking into the future, the combined pressures of climate change and the social and environmental impacts of mining might prove to be an explosive combination in some locales, especially in situations with a history of conflict over the extractive industry (*Twerefou 2009*).

For example, Peru welcomed a surge of new investment in its resource sectors following the end of its communist insurgency, benefiting from a global increase in demand. The development of mining, logging, and large-scale agriculture operations throughout the highland areas, however, spurred conflicts over water and land use with local farmers and indigenous groups. NGOs accused the government of disregarding environmental standards and the interests of local communities (*Feldt 2007*), leading to violent conflict and the deaths of at least 57 environmental and land activists in the last 13 years, most related to conflicts over mining and logging operations (*Global Witness 2014; Verité 2013; Jamasmie 2014*). Victims were often from indigenous tribes with some degree of land tenure but no capacity to enforce it. Further changes in water availability due to rapidly receding glaciers may exacerbate conflicts between mining projects, small-scale informal miners, and farmers (*USAID 2012c*).

Local resource competition can spur conflict in situations of fragility

When relationships between citizens and authorities are particularly poor, the chances of local resource competition turning into conflict increase. In 2011, public rejection of the Mubarak regime was, for many Egyptians, also a rejection of the elites who dominated the economy and controlled much of the country's arable land. Millions of landless citizens were acutely affected by Mubarak's phasing out of earlier land reforms (*Prosterman 2011*). The misuse of Nile River water and groundwater by water-intensive cotton and wheat farms revealed the stark gap between those with good land and water and those without. The recent restoration, to some degree, of elements of the old political regime and its economic partners may not bode well for continuing stability in a country where climate-related water constraints are likely to increase (*Ayeb and Bush 2014*).

Local resource conflicts can have a transboundary dimension

Conflicts over water resources occur at all levels. In the Ferghana Valley in Central Asia, citizens of three countries—Kyrgyzstan, Uzbekistan, and Tajikistan—struggle with unresponsive governments, wasteful Soviet-era water systems, poor land management, and complicated national water dynamics (*International Crisis Group 2014b*). These challenges are predicted to become more acute as glacial melting first increases and then decreases water flows to the region (*Hijioka et al. 2014*).

In Uzbekistan, due to the government's preference for water-intensive cash crops such as cotton and wheat, large collective farms have better access to water than small private farmers. In Tajikistan, deep poverty, troubled politics, a near total reliance on hydropower, and cotton monocropping combine to create situations of fragility, particularly when seasonal water lows lead to energy deficits, spurring tensions and violence (*Mitra and Vivekananda 2013*). Local scarcities have increased tensions both within countries and across national borders, leading to violent confrontations between villagers. Since each of the three countries in the valley is home to small pockets of minority populations, local disputes over water or land sometimes assume ethnic dimensions (*UNEP et al. 2005*).

These local competitions may take on greater significance given the recent history of the valley, where insurgent movements are active and border clashes are common. Inter-ethnic conflict has been on the rise since hundreds of thousands were displaced by ethnic clashes in Kyrgyzstan in 2010 (*Kyrgyzstan Inquiry Commission 2011*). With the governments of all three countries worried about domestic stability, local resource conflicts are influencing policy decisions at the national level, increasing mistrust between the states, and serving as potential trigger points for a wider conflict. This situation has been especially worrying since a 2012 dispute over hydropower projects in upstream Kyrgyzstan and Tajikistan that nearly provoked military conflict with downstream Uzbekistan (*International Crisis Group 2014b*).

Women as agents of change

Women in developing countries can be effective agents of change in mitigation and adaptation efforts. Recent research conducted in the Sahel by Mercy Corps (2013) found that 'when women and youth have increased influence over household decision-making, … the ability of the entire household to absorb, adapt, and transform in the face of shocks and stresses is increased. Their traditional responsibilities for managing natural resources in households and communities make them pivotal to adapting livelihood strategies to a changing climate. Moreover, many women have a wide knowledge of natural resources that should be used to improve climate change adaptation and disaster reduction strategies. For example, women's experience collecting water and producing crops is often overlooked in irrigation projects that allocate agricultural land to male farmers (*IFAD 2014*).

Darfur
Climate change and pastoralist conflicts

Pastoralism—the practice of raising livestock on communal lands—has long been an effective livelihood strategy in arid regions. Today, however, pastoralists in the Sahel and East Africa are increasingly limited by their growing populations, government policies favouring other sectors (e.g., intensive agriculture, tourism, and environmental protection), environmental degradation, and direct competition with other groups for resources (*Kirkbride and Grahn 2008*). As their requirements for land and water increase, the increasing variability of rainfall can feed into existing conflict dynamics and increase the potential for violent conflicts (*Rüttinger et al. 2011b; Rüttinger et al. 2011a*).

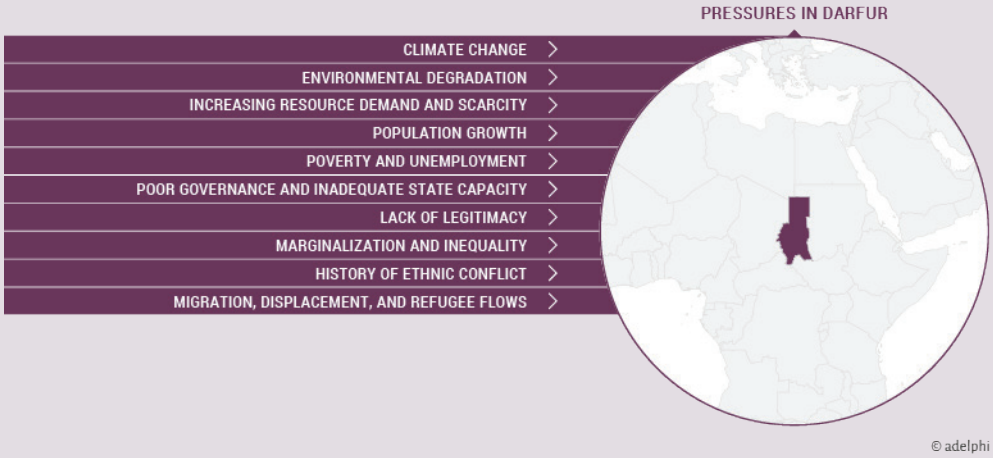
In Darfur, the increasing scarcity of productive land and reliable water has become a major conflict driver for a population already stricken by underdevelopment, poor governance, political marginalization, entrenched ethnic conflict, and a shortage of economic and human capital. The vast and sparsely populated Darfur region has low and variable rainfall, which has required groups to develop traditional rules for herder routes, rights to water sources, and dispute resolution systems (*Bromwich 2008*). But in recent decades, the traditional systems that upheld these rules have been disrupted by three factors:

- Since 1972, the region has experienced 16 of the 20 driest years ever recorded.
- Darfur's population grew from just over 1 million in the mid-1950s to about 6.5 million in the early 2000s.
- New boundaries of tribal homelands and modified relations between tribal and national leadership (notably in 1971 and 1986) weakened traditional governance (*Bromwich et al. 2007; Takana 2008; Mundt 2011*).

UNEP (2007) lists more than 30 conflicts in Darfur since 1975 in which environmental issues and livelihoods have been a factor.

When civil war broke out in 2003, with the rebel groups (SPLA and JEM) arrayed against the government and its Janjaweed militias, tensions rose across the vast and diverse region. Armed groups had no difficulty recruiting young men from the desperate and often dislocated populations (*Royo Aspa 2011*). A long history of ethnic conflict in the region made for ready cleavages—reports of ethnic cleansing were common, wells were poisoned, and farmers intentionally burned grasslands and destroyed water points to deter pastoralists from grazing (*UNDP 2011*). Internally displaced people were vulnerable to attacks and gender-based violence (*Human Rights Watch 2005*).

The competition over scarce resources was an added stress factor in the conflicts in Darfur. Conflicts over specific resources were also key flashpoints in the larger conflict (*UNDP 2011*).



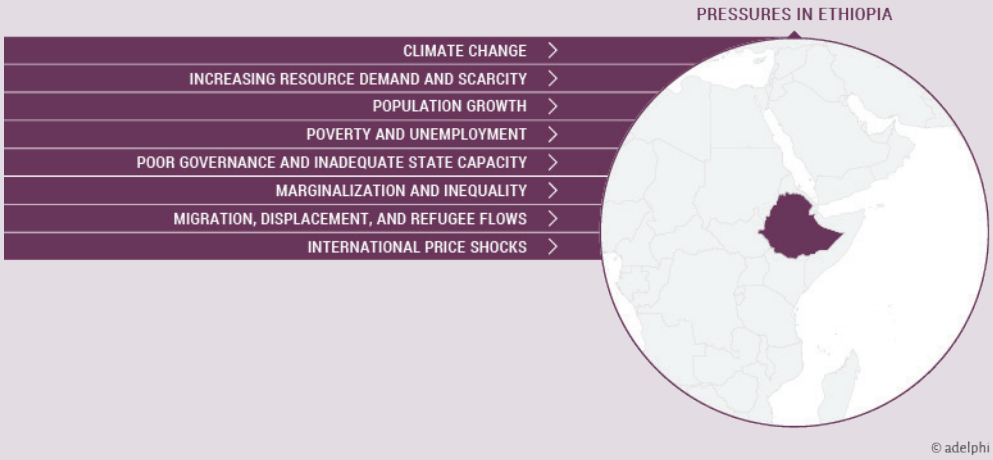
© adelphi

Ethiopia
Land grabs and the global farms race

Competition over land can be exacerbated by international involvement. The spikes in food prices in 2008–9 and 2011 were triggered by, among other factors, a series of extreme weather events around the globe (*Oxfam 2012*). The ensuing public unrest increased the interest of some developed countries in acquiring farmland abroad, leading to increased competition over arable land in the target countries. A World Bank study in 2011 counted more than 46 million hectares in large-scale farmland acquisitions and negotiations between October 2008 and August 2009, two-thirds of it in Sub-Saharan Africa (*Deininger and Byerlee 2011*). This practice is often called 'land grabbing' (*Murphy 2013*).

Between 2004 and 2009, the Ethiopian government leased or sold more than 1.2 million hectares of farmland to foreign investors (*Deininger and Byerlee 2011*). More than 800 foreign-financed agricultural projects were approved, leasing fertile farmland at less than US$1 per acre per year (*Bunting 2011*). While the land deals were presented as beneficial to Ethiopians, the promises of new technologies, employment, and agricultural modernization have not materialized (*Mittal 2013*). And though Ethiopia has large areas of arable land, when the acquisitions took place, a large part of the population—7.5 million—was already food insecure (*FAO and WFP 2009*).

These land deals often lack transparency, preventing the public and displaced populations from learning the value of the deal or the land. The authoritarian Ethiopian government systematically marginalizes indigenous communities, ignoring national and international law, human rights standards, basic needs, and minority rights during these land acquisitions (*Hennings 2014*; *Schellhase 2013*). In 2003, more than 400 people were killed by government forces for resisting foreign investment projects, leading to conflicts with local communities and indigenous groups (*Koprucu 2011*). The Anuak community in the Gambella region was violently relocated to state-created villages that lacked public services, and the Ethiopian military was reported to have committed murder, rape, false imprisonment, and torture while clearing the land (*Peebles 2013*). Such forced resettlement programmes may have troublesome knock-on effects, fuelling inter-ethnic resource competition in new settlement areas and clashes between agro-pastoralists and working migrants from the highlands (*Hennings 2014*). They may also have regional repercussions as pastoralists flee to Kenya or South Sudan, which could lead to increased resource pressure in these areas. These types of movements have already triggered conflict in the contested Ilemi Triangle (*Sagawa 2010*).



India

Cauvery River: Competition over water

The Cauvery River water dispute between the Indian states of Tamil Nadu and Karnataka (and including Kerala and Puducherry) dates to the 19th century. A 1924 agreement lapsed in 1974, leading to years of negotiations. An interim award by an independent tribunal in 1991 led to widespread rioting, ethnic tensions, and attacks on Tamils in Bangalore. In good water years, the problem faded from the headlines, but in 1994–95 and 2002, when the monsoons failed, public protests in Mandya and Bangalore became violent and rioting in Karnataka led to attacks on Tamils (*Pereria 1998; Global Sustainability Institute 2014*). This instability has led to grievances and a lack of cooperation between groups (*Bhattacharya and Poddar 2012*). In 2014, tensions and public protests flared up again but eased as the monsoon strengthened and water returned to the Cauvery River (*Global Sustainability Institute 2014*).

Tamil Nadu relies on the Cauvery River for irrigation. Agriculture, an important economic sector, provides livelihoods for millions of farmers. Karnataka's industrialized urban centres, such as Bangalore, also rely on the river's water and the electricity generated by its dams. Water scarcity is driven by increasing demand from agriculture, a growing population, urbanization, and industrialization, coupled with reduced and irregular rainfall (*Fleischli 2007*). While it is clear that climate change will significantly affect the monsoon and most likely will increase extreme weather events, there is no scientific consensus how exactly the rainfall will change (*Turner and Annamalai 2012*).

CLIMATE-FRAGILITY RISKS	
Will increase if . . .	**Will decrease if . . .**
Monsoons fail for multiple years in a row, leading to severe water shortages.	Climate change impacts are slow to arrive, allowing more time to adapt and build local climate resilience.
Poor political and technical water management decisions (e.g., based on poor data) waste excessive water or degrade water sources.	Accurate information on weather, water, and market conditions is widely available and used to sustainably manage water supplies.
A political settlement imposed from above is seen as unfair by certain population groups and creates grievances.	A negotiated and long-term solution is perceived as fair by a majority of the population.
The river dispute is framed using competitive, winner-takes-all tactics by political leaders, exacerbating existing conflict structures.	Cooperative politics breaks the cycle of conflict.
Economic dependence on the river's water continues to increase, exacerbating vulnerability to changes in water availability. Economic development is unequal, exacerbating economic differences between states and population groups.	Economic diversification provides more opportunities, reducing poverty and vulnerability. Water-saving technologies help reduce water demand.

Mozambique
Competition over land

One of the poorest countries in the world, Mozambique is among the most affected by disasters, particularly floods and droughts, and the most threatened by climate change (*Nussbaumer and Patt 2009*). While its population density is relatively low, population growth is rapid, and land with a low risk of droughts or floods is increasingly scarce, leading to conflicts over land use (*Margulis and Hughes 2005*).

In 2007, the government committed 30,000 hectares to producing ethanol, but the Ministry of Tourism had already been promised the same land for a national park. As tensions rose between ministries and the involuntarily relocated villagers, the biofuels project was cancelled (*Tuttle 2014*). The country is seeking to diversify its economy. Delays in the development of offshore gas fields could quicken the pace of biofuel development or other large-scale agricultural projects. If climate change reduces the amount of productive land, these projects could increase competition over land (*Thaler 2013*). Given the country's long history of civil war and a recent bout of violence in 2013, local squabbles over land rights could also trigger tensions and conflict at the national level.

CLIMATE-FRAGILITY RISKS	
Will increase if . . .	**Will decrease if . . .**
Drought and flood frequency and severity increase, having a negative impact on the livelihoods of local populations.	Climate change impacts are slow to arrive, allowing more time to adapt and build climate resilience.
Major land allocation decisions are made opaquely, entrenching power inequalities and creating grievances.	Effective, fair, and transparent land management systems help manage land conflicts peacefully.
Regional relations backslide, decreasing regional exchanges and trade and hindering economic growth and diversification.	Regional economic integration and trade improve local livelihoods and diversify the economy.
Divisive, civil war–era politics returns and security-sector reform efforts unravel, increasing the potential for conflict and the prevalence of transnational criminal networks.	Cooperative politics and security-sector reform efforts enhance human and national security and strengthen state legitimacy.
The number of subsistence farmers, who are especially vulnerable to climate change impacts, increases. Economic development is inequitable, creating new grievances.	Diversification provides more economic opportunities, reducing poverty and vulnerability.

2.3 Livelihood insecurity and migration

Climate changes will increase the human insecurity of people who directly depend on natural resources for their livelihoods, which could push them to migrate or turn to illegal sources of income.

Climate change has a direct impact on the livelihoods of people who depend on natural resources. In some areas, it will reduce grazing land, dry up water bodies needed for irrigation, and threaten jobs connected with climate-sensitive natural resources. These environmental changes can combine with other problems—such as unequal land distribution, insecure land tenure, poorly developed markets, trade barriers, and inadequate infrastructure—to push populations to seek alternative livelihoods. Some will move to urban areas that already suffer from high levels of unemployment and poor living conditions, while others may be forced to turn to informal or illegal sources of income. Climate change will alter both existing migration patterns and the volume of people likely to move. Although demographic trends and vulnerability will remain primary drivers of international displacement, climate change and increasing exposure to hazards will add to the displacement risk across borders in the future. While migration can be an effective coping mechanism in the face of climate stress, the increased movement of people could also lead to local and potentially regional instability if migration and resettlement are poorly managed.

LIVELIHOOD INSECURITY AND MIGRATION	
What is the risk?	For people dependent on natural resources for their livelihoods, climate changes could increase unemployment, influence their migration patterns, or push them to seek alternative sources of support. Each of these options could increase fragility by increasing pressures, such as high rates of unemployment among young men, migration to resource-stressed areas, and competition over resources. It could also make joining armed groups and criminal gangs more attractive.
Tipping points	• Large numbers of rural residents migrate to cities, which lack the infrastructure and basic services to cope with a sudden influx of new residents. • Climate change disproportionately affects the livelihoods of certain groups, compounding inequalities and fuelling grievances between groups. • Climate change degrades the livelihoods of the rural poor in remote and fragile areas that are plagued by high levels of organized crime (e.g., drug trade or piracy), making people more likely to engage in illegal activities.
Entry points	• Ensure that bilateral and multilateral development cooperation focuses on preventive and early action to strengthen livelihoods and local resilience. • Understand the changing dynamics of migration and support peaceful management of these trends. • Base measures to increase resilience and prevent conflict (e.g., stabilization and post-conflict programmes) on a better understanding of climate change and poor people's livelihoods. • Fund programmes that improve ecosystem management to protect and enhance the natural services that support livelihoods.

Climate change will increase livelihood insecurity by changing rainfall patterns and reducing fisheries

The IPCC (*2014*) projects that climate change will alter the frequency and magnitude of both floods and droughts. This variability will have a profound impact on farmers, who depend on predictable rainfall patterns. Globally, the damage from floods will increase because more people and more assets will be in harm's way (*IPCC 2014*). Heavy rainfalls are likely to become more intense and frequent in many parts of the world, which may increase soil erosion even if total rainfall stays the same (*Seneviratne and Nicholls 2012; IPCC 2014*). Soil erosion will degrade soil quality, decreasing crop yields. More landslides in mountain regions will also make livelihoods more dangerous and less sustainable (*IPCC 2014; Tse-ring et al. 2010*).

At the same time, small-scale fisheries increasingly face climatic shocks, such as cyclones, floods, sea-level rise, droughts, and temperature and rainfall fluctuations. These climate events will decrease the number and distribution of fish and disrupt fishing operations, reducing economic returns. As fisheries and aquaculture support the livelihoods of 10–12 percent of the world's population—most of them in the Asia-Pacific region—climate impacts on the sector will be significant (*FAO 2009; FAO 2010; FAO 2014b*).

People dependent on climate-sensitive natural resources will seek alternative livelihoods or locations, increasing the risk of conflict

Climate change will decrease the viability of livelihoods and jobs that depend on natural resources. This livelihood insecurity, combined with other pre-existing challenges, can increase the risk of local conflict. Changing rainfall patterns and seasonal droughts in the Sahel, in combination with other social, economic, and political factors, have pushed pastoralists to switch to farming or to migrate south and towards the coast, increasing competition for water and arable land with farming and fishing communities (*UNEP 2011a*). In Turkana, Kenya, many nomadic pastoralists have turned to fishing as pastureland has dwindled due to recurring droughts, leading to deadly conflicts between rival Kenyan tribes and with Ethiopian fishermen on the other side of the lake (*Yongo et al. 2011*). Mountain communities in Tajikistan, Rwanda, and Nepal facing soil erosion and landslides have moved in search of more stable ground. In some instances, entire villages have moved, increasing the risk of conflict with neighbouring communities that are also resource-stressed (*Tse-ring et al. 2010; Modola 2013*).

Women are more vulnerable to livelihood insecurity and at risk

Although the exact figures are highly contested, it is widely recognized that women are more likely to be poor than men, and thus are more at risk from climate change's impacts on livelihoods (*Chant 2008*). Since women produce 45–80 percent of all food in developing countries, as climate change decreases the availability of food, it will also decrease the economic security, food security, and health not only of women but also of their families and communities (*UN WomenWatch 2009*).

In many households in developing countries, women and girls are also responsible for securing water and fuel for cooking and heating (*IEA 2006*). As changing weather patterns decrease water resources in many regions, time spent fetching water from more distant sources could keep women and girls from pursuing economic activities and educational opportunities. In many countries, women have fewer social, economic, and political opportunities than men, limiting their individual capacity to adapt to climate changes (*UNICEF 2012*).

Understanding the role of governance is key

Livelihood insecurity is also linked to non-climate factors, including unequal land distribution and tenure, trade barriers, and poor infrastructure (*UNEP 2011b*). The communities that lack the

institutions, economic stability, civil society, and social capital to withstand increases in the frequency and severity of climate change will be most at risk of political instability and conflict (*UNEP 2011b*). We must understand the key role of governance in planning and regulating development, ensuring access to land, building infrastructure, and promoting diverse livelihoods (*UNEP 2011b*).

Fewer employment opportunities, especially among youth, can exacerbate conflict

Large youth populations can boost their countries' economies. However, under certain conditions, large youth cohorts are correlated with a higher risk of violence, particularly where there is high unemployment or in countries emerging from conflict (*Arowosegbe 2009; Collier et al. 2009; Urdal 2008*). In such contexts, climate impacts are likely to complicate economic growth, increase pressure on livelihoods, and increase competition for jobs among youth. Across all regions, young men are among the most likely to migrate in search of work, especially when livelihoods that depend on natural resources, such as fishing or farming, become less viable (*Schilling et al. 2014; Deheza and Mora 2013*). The ability to migrate can also reduce conflict by acting as a release valve, but only if there are livelihood opportunities available to the migrants.

A lack of viable alternative livelihoods, particularly for rural youth and young men, can compound pre-existing grievances or inequalities. In certain fragile situations or where formal employment options are limited, some youth may be drawn to criminal activities such as illegal fishing, poaching, piracy, drug trafficking, or armed groups. In 2006–7, for example, a drought in Afghanistan's northern Balkh region forced some downstream villagers to look for new livelihood opportunities with armed groups (*Heijman et al. 2009*).

As people take steps to decrease their reliance on climate-sensitive natural resources, urbanization will increase

To reduce their dependence on climate-sensitive natural resources, households are increasingly seeking a safety net. For example, some workers seasonally migrate from coastal Bangladesh to urban centres such as Dhaka. This short-term rural-to-urban migration is a way to diversify their incomes, especially in times of agricultural shortage (*Tacoli 2009*). If not managed peacefully, these migration patterns could stress infrastructure systems and basic services in already overcrowded cities, leading to tensions between host and migrant communities (*Mitra and Vivekananda 2013*).

Shifting to alternative livelihoods will create winners and losers

When people compete for the same scarce natural resources but unequal power dynamics limit access to them, the risk of fragility can increase (*Houdret et al. 2010; Houdret 2008; Gehrig and Rogers 2009; Richards 2002; Lecoutere et al. 2010*). For example, competition between traditional fisherman and shrimp farmers for the same water resources in India's Lake Chilika increased when saltwater, driven by more frequent storm surges, infiltrated the lake and decreased the fish catch. As the lake became saltier, wealthy businessmen bought up leases from poorer fishermen and built enclosed shrimp farms. As the livelihoods of the fishermen deteriorated, violent clashes increased (*Mitra et al. 2013*).

Migration could improve livelihood security and reduce vulnerability to risks

Climate change will influence the factors that drive migration, changing both migration patterns and the volume of people likely to move, but the relationship is complex. The Foresight Report found that 'environmental change is equally likely to make migration less possible as more probable' (*Black et al. 2011*).

Temporary migration is sometimes a necessary and expedient way to cope with disasters. For example, during the 1983–85 drought in Mali, a majority of families survived by temporarily migrating (*Findley 1994*). Migration can help improve livelihood security and reduce vulnerability to both environmental and non-environmental risks. Following landslides in Tajikistan, people in the affected areas moved to Russia in search of gainful employment. In many areas of Tajikistan, remittances from family members in Russia now provide more household income than cotton, the country's dominant cash crop (*Mitra and Vivekananda 2013*). By contributing to income diversification or remittances, voluntary migration can thus be an effective adaptation strategy and thereby strengthen the resilience of affected communities (*European Commission 2013b*).

Migration can create new risks, but not necessarily 'climate refugees'

Both men and women migrate in search of better or more secure livelihoods; but in certain cultural contexts, the distances women can travel from their homes are constrained. Men often travel farther away, leaving women to head the households. Some people may be unable to migrate because they are trapped by conflict or environmental risks such as floods. In Somalia, pastoralists cannot relocate due to the armed conflict, which also keeps humanitarian organizations from providing assistance. Such constraints can push people to migrate in illegal, irregular, unsafe, exploitable, or unplanned ways (*Black et al. 2011*).

Migration — in the form of asylum-seeking 'climate refugees' — is often portrayed as a major public policy challenge for industrialized nations. Methodologically, it is very difficult, if not impossible, to isolate the different drivers and triggers of migration. Migration is a multi-causal phenomenon. While demographic trends and vulnerability remain the primary drivers of cross-border displacement, climate change and increased exposure to hazards will exacerbate the risk of displacement in the future (*NRC and IDMC 2014*).

Predictions of the number of people likely to be displaced as a result of climate change are often based on crude population estimates, as reliable statistics do not exist in many affected areas. These numbers do not distinguish between those people who could potentially migrate and those who are actually likely to migrate. The poorest people generally cannot afford to migrate overseas (*Castles 2000; Haan 2000; Skeldon 2002*). These predictions also fail to adequately consider other adaptation strategies (*Black et al. 2011*). However, the effects of climate change (including disasters induced by extreme weather) can be expected to increase the number of people who are forced or choose to move across national borders (*NRC and IDMC 2014*). Thus, climate change will alter both existing migration patterns and the volume of people likely to move.

Syria

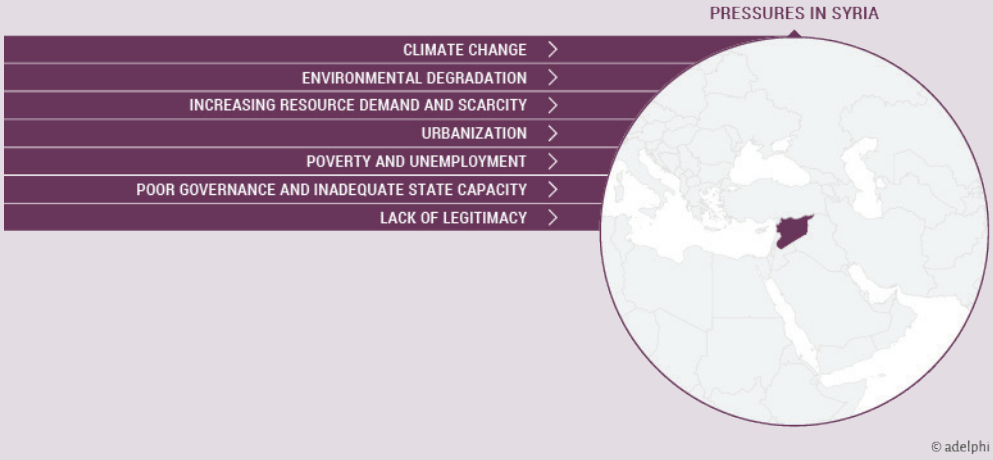
Drought, livelihood insecurity, migration, and conflict

What started as a peaceful protest in March 2011 against President Bashar al-Assad's regime has degenerated into a bloody conflict. The Syrian uprising was triggered by a series of socio-economic, political, and environmental factors, including growing poverty, rising unemployment, lack of political freedom, corruption, a widening rural/urban divide, a severe drought, resource mismanagement, and the impact of climate change on water and crop production (*Châtel 2014*).

Between 2006 and 2011, Syria suffered a severe drought. It hit the northeast region—the country's breadbasket—the hardest. Herders in the northeast lost nearly 85 percent of their livestock, affecting 1.3 million people (*United Nations 2010*). Nearly 75 percent of families that depend on agriculture suffered total crop failure (*Erian et al. 2010*).

The drought was exacerbated by a long legacy of resource mismanagement. Large government subsidies for water-intensive wheat and cotton farming encouraged inefficient irrigation techniques (*Femia and Werrell 2012*). Farmers sought to increase supply by tapping the country's groundwater resources. As the drought dragged on into its second and third years, the Syrian government cancelled a number of state subsidies, which overnight multiplied the price of diesel fuel and fertilizers (*Châtel 2014*).

The massive loss of livelihoods pushed farmers, herders, and rural families to migrate to overcrowded cities, stressing urban infrastructure and basic services, and increasing urban unemployment. More than 1 million people were food insecure, adding substantial pressure to pre-existing stressors, such as grievances and government mismanagement. This food insecurity was one of the factors that pushed the country over the threshold into violent conflict (*Kelley et al. 2014*). The government failed to respond to the humanitarian crisis, fuelling simmering discontent in the rural areas. The first protests began in the rural town of Dara'a, where secret police arrested and tortured a group of teenagers. People in other cities gathered in support of the 'children of Dara'a'. The initial protests followed the path of the drought. These peaceful protests to express people's grievances at the government's failure to act later escalated into the civil war that continues today (*Werrell and Femia 2013*).



Mali
Drought and the Tuareg rebellion

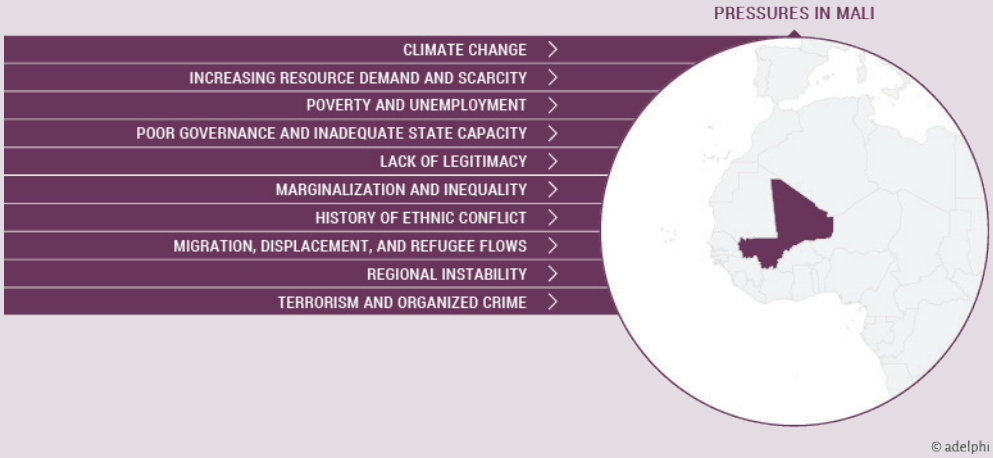
In 2012, a coup d'état overthrew the government of Mali. The destabilization of the country before and after the coup was fuelled by several external factors—including the crisis in Côte d'Ivoire, the Arab Spring, the war in Libya, international terrorist groups, and illicit trade of drugs and arms—along with internal issues, such as the country's slow decentralization, corruption, northern separatism, demilitarization, high population growth, youth unemployment, and the rebellion of the Tuaregs, which played an important catalytic role (*Davis 2014*).

The arid north of Mali, home to only 9 percent of the population, is a climate vulnerability hotspot (*USAID 2014c*). The cumulative effects of more frequent severe droughts, increasingly erratic rainfall, and rampant desertification have badly undermined natural resource-dependent livelihoods and communities' capacity to recover from shocks. The 2005, 2010, and 2011–12 droughts degraded the water table, killed off livestock, and spurred a mass exodus of young people. Along with resource scarcity, unemployment, economic fragility, weak governance, terrorism, and crime have combined with the many other grievances to underpin several Tuareg rebellions, including the 2012 rebellion led by the National Movement for the Liberation of Azawad, whose loss of control and the subsequent insurgency in northern Mali by Islamist militants led to an international military intervention (*Sidibé 2012*).

The root causes of conflicts within Mali are complex and interlinked, though most of the grievances arise from entrenched economic and political marginalization of certain groups. Since independence, successive 'anti-nomad policies' have undermined pastoralists' access to grazing land and water (*Bakrania 2013*), leaving them more vulnerable to environmental stress. Land tenure reforms, development policies, and political reforms during the intense modernization of agriculture in the 1960s successively fuelled the feeling of abandonment among pastoralists (*Goulden et al. 2011*). Many other drivers have also spurred grievances, such as the government's violent repression of rebellions, wider regional instability in Niger and Libya, and NGO reports that the government embezzled international drought relief aid (*Benjaminsen 2008; Watts 2012; Hendrix and Brinkman 2013; Poulton and Youssouf 1998*).

The state's inability to meet the basic needs of the population or to deal with the country's successive environmental and political crises have eroded its credibility and legitimacy, weakening the social contract between some Tuareg and Arab populations and the Malian government. The security vacuum in the northern part of the country enabled criminal groups to proliferate; and in turn, chronic insecurity contributed to forced migration and the destruction of food and livestock, maintaining the vicious cycle of violence and instability (*Sidibé 2012; Bakrania 2013*).

Although constitutional order was restored following the 2013 presidential and parliamentary elections, and today economic recovery seems possible, Mali is still suffering from multiple interconnected crises, which together place immense stress on a country highly vulnerable to both climate change and conflict.



Guatemala
The coffee leaf rust outbreak

Guatemala's 36-year civil war left a legacy of insecurity and poverty when it ended in 1996. With the highest levels of inequality and poverty in the Latin America, the country is one of the most violent in the world, with the fifth-highest homicide rate (*UNODC 2013*). Its lack of economic and social opportunities, combined with access to firearms, has fuelled the spread of organized crime, gangs, and narco-trafficking (*Feakin and Depledge 2010*).

Among the most important agricultural commodities produced in Guatemala, coffee provides jobs to 11 percent of the workforce (*Index Mundi 2014; International Coffee Organization 2013*). Coffee farmers in Central America—more than 90 percent of whom are small or medium-sized producers—depend heavily on a single boom-and-bust cash flow crop (*USAID 2006*).

In 2012–13, the coffee leaf rust outbreak (la roya) devastated coffee crops in Central America, reducing yields and quality. In Guatemala, coffee production was projected to decline 16 to 32 percent during the 2013–14 season, drastically reducing revenues (*FEWS NET 2014*). Producers are hiring fewer unskilled day labourers and paying lower wages, reducing the coffee-related income on which a high percentage of the population relies. During the crop year 2012–13 alone, la roya robbed Guatemala of 75,000 coffee-sector jobs, representing 15 percent of the coffee sector's total workforce (*International Coffee Organization 2013*).

The epidemic proportions of the outbreak are due to increased temperatures and rainfall variability, which have enabled the fungus to spread quickly. The crisis illustrates how climate-related changes such as the proliferation of pests and diseases can exacerbate livelihood insecurity in an already stressed country. This may potentially increase crime and insecurity as coffee workers seek alternative incomes.

CLIMATE-FRAGILITY RISKS	
Will increase if . . .	**Will decrease if . . .**
A loss of coffee-related employment and income increases the number of unemployed youth and farmers seeking income from gangs and narco-trafficking networks.	Unskilled, rural labourers and youth are less dependent on coffee for income, due to job training programs and sustainable alternative crops.
Migration flows from rust-affected regions to Guatemala City, Mexico, and the United States increase pressure on infrastructure, social services, and security in already stressed and poor urban areas. The security sector responds to potential urban riots with brutality and human rights abuses.	Migration flows are managed peacefully. Urban infrastructure, social services, and security provisions are strengthened to cope with increasing numbers. Security actors are trained to manage civil unrest peacefully and to avoid human rights violations.
Inequitable responses to the rust crisis benefit only large-scale coffee producers, arousing resentment among smallholder farmers or reviving conflicts over land between minority wealthy landowners and indigenous communities.	Crisis responses include farmers in the decision-making process and manage expectations of the most affected small-scale farms. Crisis responses target the most vulnerable farms, since the wealthiest coffee producers are able to find other methods to cope with crisis.

Sierra Leone

Climate change, decreasing fisheries, and livelihoods at risk

Sierra Leone's waters contain some of the richest fish stocks and biodiversity in the world. These fisheries provide jobs to more than 400,000 people and supply almost 80 percent of total protein in the population's diet (*Seto 2011*). However, Sierra Leone's fish stocks are already declining, due to overfishing and unsustainable fishing practices compounded by climate change. Ocean acidification will redistribute global marine species and reduce marine biodiversity, particularly in tropical areas, where yields are projected to decrease by up to 40 percent by the 2050s (*IPCC 2014*).

Sierra Leone's waters are targeted by unscrupulous industrial fishing vessels looking for profit. Estimated losses from illegal, unreported, and unregulated fishing amount to US$29 million per year, representing 25–50 percent of the country's total reported catch (*Brown and Crawford 2012; Marine Resource Assessment Group 2005*). In the absence of effective monitoring and law enforcement, foreign fishing vessels unfairly compete with local fishers. Destructive fishing methods, such as bottom trawlers, further deplete fish stocks through excessive bycatch and by undermining the seabed. These pressures are exacerbated by the loss of mangrove forests that nurture coastal fisheries (*Brown and Crawford 2012*).

One of the poorest countries in the world, Sierra Leone's economy suffered from the 2014–15 Ebola crisis, among other factors; in 2014, its income growth rate fell by more than half, to 4.0 percent, instead of the 11.3 percent increase expected before the crisis (*Thomas et al. 2015*). It is possible that the competition over fisheries and the lack of alternative employment may push some fishermen into piracy, as happened in Somalia.

CLIMATE-FRAGILITY RISKS	
Will increase if . . .	**Will decrease if . . .**
Decreasing fish stocks and smaller fishing catches lead to acute competition among local fishers, arousing latent tensions between communities.	Local mechanisms are used to resolve conflict. Communities are involved in local fisheries management.
Illegal, unreported, and unregulated fishing creates unfair competition, arousing resentment among local fishermen and triggering deadly competition between industrial vessels and local fishers. Industrial fishing vessels force local fishers closer to the shore and sometimes into fish nurseries, eroding future fish stocks.	Laws protecting fish and local fishermen are enforced in territorial waters. Authorities and fishing communities share information on illegal fishing vessels. Maritime cooperation protects economic rights and builds capacity for maritime law enforcement.
Few alternative livelihoods and economic opportunities among fishing communities fuels crime and piracy.	Investments in the most vulnerable coastal areas support alternative 'climate-proof' livelihoods and increase the opportunity costs of engaging in criminal activities.
Government management of protected areas produces disparities within fishing communities and undermines the only source of livelihoods of a particular zone or area, leading to conflict between fishing communities and local authorities.	Protected areas are co-managed. Awareness of the importance of fish breeding areas is raised. Regulations on destructive fishing methods, such as dredging, are established and enforced.

2.4 Extreme weather events and disasters

Extreme weather events and disasters will exacerbate fragility challenges and can increase people's vulnerability and grievances, especially in conflict-affected situations.

Extreme weather events and disasters endanger and destroy people's lives, livelihoods, assets, social safety nets, health, and communities. The relationship between disasters and fragility is often mutually reinforcing; disasters put additional stress on stretched governance systems, decrease economic opportunities, reduce resources, and displace people. A lack of safety nets, preparedness, insurance mechanisms, and assets to cope with the impacts of the disasters can fuel community grievances, especially if government or international assistance is inadequate or is inequitably distributed. Poorly designed humanitarian interventions can also exacerbate tensions and increase the risk of conflict. In addition, in fragile and conflict-affected situations, disasters can undermine or override efforts to bolster resilience, increasing the severity of the disaster's impact. Conversely, disaster risk reduction and effective disaster management efforts can also provide opportunities to improve resilience to climate-fragility risks and build peace.

EXTREME WEATHER EVENTS AND DISASTERS	
What is the risk?	Extreme weather events and disasters can compound pre-existing grievances, stressing already stretched governance systems; decrease economic opportunities and available resources; and increase displacement. In fragile and conflict-affected situations, disasters can undermine the resilience of at-risk communities, increasing the severity of the impact. The unwillingness and inability of governments to prevent or manage disasters can increase fragility significantly by undermining the legitimacy of governments. However, if managed well, such crises can also provide opportunities to build resilience and peace.
Tipping points	• A major one-off extreme weather event and disaster hits an already fragile area, or a series of mid-level disasters hits the same fragile area over a short period of time. • A government in political crisis is unable or unwilling to respond appropriately to a disaster. • A government uses a disaster to marginalize certain population groups.
Entry points	• Use diplomatic initiatives and international support for disasters to build resilience and peace. • Make integrating support for disaster risk reduction, peacebuilding, and climate change adaptation in developing countries an explicit foreign policy goal. • Focus on crisis prevention and provide human, natural, financial, and legal resources that are flexible enough to proactively address and respond to extreme events. • Translate global information for local use and include local information in worldwide risk monitoring and assessment.

Fragile and conflict-affected areas are more vulnerable to the impacts of extreme weather events and disasters

The UN defines natural disasters as 'the consequences of events triggered by natural hazards that overwhelm local response capacity and seriously affect the social and economic development of a region' (*IASC 2006*). These include slow-onset disasters, such as droughts, and sudden shock events. Future projections show that the incidence and magnitude of disasters will only increase, with fragile and conflict-affected areas most vulnerable to the impacts (*DFID et al. 2011*). From 2005 to 2009, more than 50 percent of the people affected by disasters induced by natural hazards lived in fragile and conflict-affected areas (*Kellet and Sparks 2012*). The multiple risks these areas face will increase the demands on humanitarian responders (*DFID 2011b*).

Disasters can increase the risk of conflict and violence

It is clear that the relationship between disasters and fragility is mutually reinforcing. Disasters can compound pre-existing grievances, put additional stress on stretched governance systems, decrease economic opportunities and resource availability, and increase displacement of people—all of which can increase the risk of conflict. Particularly in fragile situations, disasters can exacerbate pre-existing conflict drivers, worsen the risk of future crises, and hamper crisis recovery efforts (*Harris et al. 2013; UNDP 2011*). For example, the 2011 East African drought intensified political instability by compounding grievances between groups over the poor governance of the food crises, leading to a full-scale humanitarian crisis and incidents of violence across East Africa (*Harris et al. 2013*). Evidence suggests that women are more vulnerable to climate-related disasters, both as victims of disaster itself and in its aftermath, due to increases in domestic and sexual violence (*Neumayer and Plümper 2007*).

Disasters change resource availability and erode livelihoods and resilience

Extreme weather events and disasters can affect the availability, access, and distribution of essential natural resources, intensifying competition for food, water, and land, which can lead to violence and instability. Slow-onset disasters, including droughts and desertification, can increase tensions between different groups of land users, such as farmers and pastoralists. Where grievances and resource competition follow slow-onset protracted disasters and lead to conflict, the violence is often local (*Hendrix and Salehyan 2012*). In Sudan, desertification and drought reduced the availability of key land and water resources, heightening competition between farmers and pastoralists. In some cases, farmers deliberately set fire to pasturelands and destroyed water points to deter pastoralists from grazing livestock, worsening the conditions of drought and food insecurity (*UNDP 2011*). Climate impacts, particularly at the sub-national level, can also affect the capacity of societies and communities to prepare for and respond to future disasters, eroding their overall resilience (*IPCC 2014*).

Disasters can alter economic opportunities in communities

Economic opportunities may be undermined through a disaster's impact on livelihood security, jobs, and access to credit. Disasters can destroy many key traditional and social coping strategies such as savings schemes, alternative livelihoods, and migration routes. Extreme weather events can disrupt women's access to their social networks and social capital (*Tunstall et al. 2006; Oswald Spring 2008; Hunter and David 2011*). By disrupting the formal economy, disasters can also open up informal economic opportunities, some of which may be criminal, increasing incentives for unemployed people to join armed groups or commit crime (*Harris et al. 2013*). On the other hand, there may be less to steal, for example, if a disaster kills the livestock that are the target of raids (*Harris et al. 2013*).

Disasters can worsen pockets of fragility by displacing people and destabilizing communities

People displaced by disasters often compete for scarce resources and livelihoods with people in the host communities, spurring disputes over land and exacerbating pre-existing ethnic or tribal tensions. For example, flooding on the Koshi River in the Terai region of Nepal in 2008 spurred the resettlement of 60,000 people to surrounding communities, stressing shared natural resources and increasing tension, which was further escalated by political groups who used flood victims' dissatisfaction over the lack of clean water and shelter to feed anti-government sentiments. When the situation turned violent, 200 policemen were sent to maintain order in the camps (*Vivekananda 2011*).

Understanding where and when receiving communities are able to absorb people is key to managing the tensions that may emerge. The relationship between disasters and conflict is reciprocal: Disasters may not only increase the risk of conflict, but conflict may also force people to migrate to areas with a higher exposure to hazards (*Harris et al. 2013*).

Temporary displacement can also be an effective coping strategy for climate change (*Ober 2014*). However, the most vulnerable populations often lack the resources and thus the mobility to migrate, leaving them trapped in disaster-prone areas (*Foresight 2011*). This is a particular problem in states experiencing situations of fragility and conflict. For example, armed conflict in Somalia prevents pastoralists from following their traditional or alternative migratory routes to flee prolonged drought (*Harris et al. 2013*).

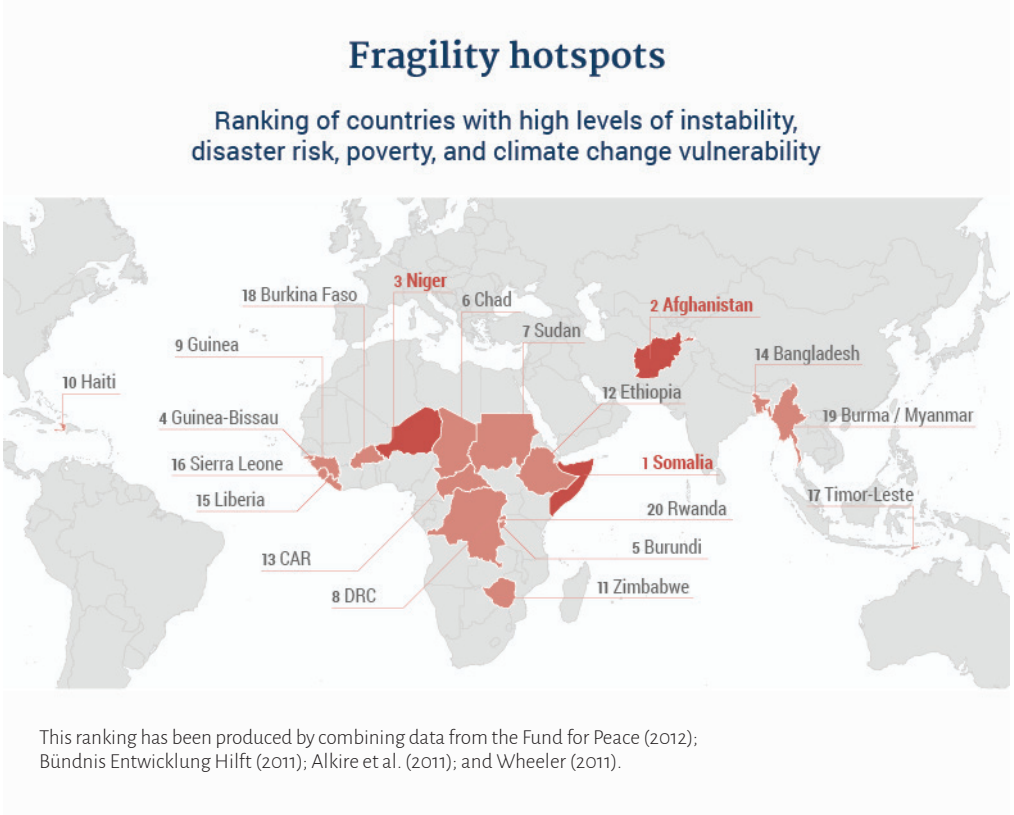
Disasters can overburden and undermine the capacity of already fragile institutions to adequately respond, heightening grievances

Resilient communities have strong infrastructure, basic services, social safety nets, livelihoods, trust, and open communication. In fragile situations, these resources are absent or deficient. Fragility can thus exacerbate the destructive effect of a disaster on governance systems, preventing the institutions from mounting rapid and effective responses (*ACF 2011; Kostner and Meutia 2011*). For example, in Haiti, a series of major hurricanes in 2004 and 2008 killed thousands of people across the country. These repeated disasters, some occurring before the damage was repaired, massively degraded the capacity of the government to protect its citizens and to plan for better responses in the future (*Aldrich 2013*). Each subsequent disaster exacerbated both violence and fragility, as the country's ineffective government struggled to keep chaos at bay (*UNDP 2011*).

By exposing the inadequacy and weakness of governments, and further crippling their capacity to manage compounding crises, disasters can threaten political stability (*Ferris 2010*). For example, in the Ferghana Valley of Kyrgyzstan, regular floods have generated grievances against the authorities by exposing not only their limited capacity to deliver services, but also the poor water management policies and systems that made the area vulnerable to drought, flooding, and mudslides (*UNEP et al. 2005*). This ineffective disaster response, combined with competition over natural resources, exacerbated socio-economic, political, and ethnic tensions (*UNDP 2011*).

Disaster mismanagement can erode the social contract

Ineffective disaster responses and the failure to prevent and manage disasters can challenge the legitimacy and authority of governments and can further erode the social contract between the government and affected communities. In Sindh, Pakistan, the perceived inability of the state to adequately support affected communities following the 2012 floods led to increased political marginalization and disaffection among affected groups (*Schilling et al. 2013*). Failure to provide emergency relief or distribute it equally can increase frustration with the government, lead to protests and public demonstrations, and exacerbate ongoing conflict. For example, in its response to the



› Adapted from Harris et al. (2013)

2006 earthquake, the Kyrgyzstan government's lack of transparency and weak public information systems spurred tension over the apparently unequal distribution of disaster assistance. Given the high visibility of disasters (especially high-impact disasters), the lack of adequate or equitable response can generate widespread popular discontent at the national level, even when the disaster itself is geographically limited (*UNDP 2011*).

Disaster responses can exacerbate inequality

The unequal distribution of post-disaster aid can exacerbate existing inequality. When disaster responses cater to the interests and needs of the elite, those living in urban areas, or the dominant ethnic group, and exclude economically or political marginalized populations, they can entrench inequalities and increase the motives for violent conflict (*Harris et al. 2013*).

Disasters can be an opportunity for peace

If managed well, disaster responses can also help resolve long-standing conflicts and foster peace, as the example of Aceh shows (see the case study on the Indian Ocean tsunami). Disasters that happen in conflict-affected states or regions can offer unexpected opportunities for transforming and potentially ending entrenched conflict dynamics. The damage and hardship inflicted by disasters holds the potential to bridge deeply rooted cleavages. In particular, where both sides are equally affected, a disaster may give rise to mutual solidarity and joint disaster relief efforts, building trust between the opposing groups (*Renner and Chafe 2007; Adger et al. 2014*).

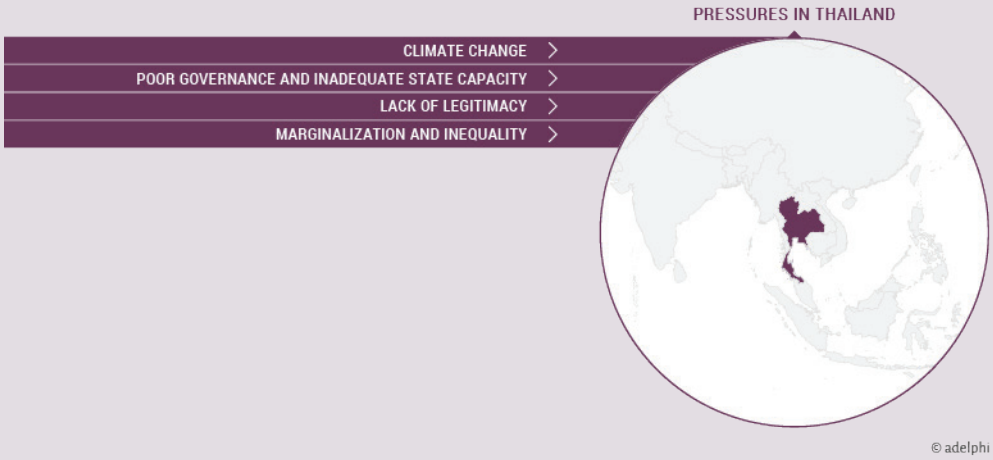
Thailand

Poor response to flooding has severe political consequences

In Thailand in 2011, 2 million people across 26 provinces were affected by floods caused by unprecedented monsoon rains, which surpassed the average rainfall of the previous 30 years. The monsoons damaged dams and reservoirs that were purposefully overfilled to mitigate the effect of 2010's weak monsoon season. During the crisis, hundreds of civilians took to the streets to protest discrimination by the Flood Response Operation Centre and the unfair distribution of water, electricity supply, shelter, and food (*Femia and Werrell 2011*). Public unrest and discontent with the government continued until a military coup in 2013.

The floods occurred when Thailand's political landscape was already fragile due to violent anti-government protests between 2008 and 2010 (*Femia and Werrell 2011*). Elections in 2011 brought a new government party to power, which had not yet proven that it could redress class discrimination and deeply rooted citizen resentment. Following the poor emergency response, angry civilians broke a sandbag wall in Bangkok, which was protecting a wealthy district from water surges (*Nindang and Allen 2012*). Breaking the sandbag barrier was a public expression of frustration with the government for its discrimination and favouritism (*Shams 2011*).

Although the government launched a three-phase recovery programme that included building new infrastructure to prepare for future floods, the compensation system was not transparent. After it was revealed that compensation was unevenly distributed, protesters demanded fairer compensation. The government's poor disaster management and its inability to address the grievances of rural flood victims were strongly criticized (*Nindang and Allen 2012*; *Thai Health 2012*).



Indian Ocean tsunami
Comparing Sri Lanka and Aceh, Indonesia

In 2004, Indonesia and Sri Lanka both experienced the same large-scale rapid-onset disaster, the Indian Ocean earthquake and tsunami. At the time, both Sri Lanka and Indonesia were embroiled in protracted conflicts. The disaster response in Aceh is credited with helping to resolve the long conflict between the Free Aceh Movement (GAM) and the national government. But in Sri Lanka, the response increased tensions between the Tamil Tigers (LTTE) and the Sri Lankan government (*Ferris 2010*).

In Indonesia, the large-scale devastation unleashed by the tsunami ended nearly three decades of conflict and led to the signing of a peace agreement in 2005. The peace was hailed in the press as a victory for 'disaster diplomacy'. Lacking the capacity to rebuild Aceh itself, the Indonesian government had to depend on the international community. The international disaster response ended the decades-long isolation imposed on Aceh during the years of the separatist conflict, providing not only disaster relief but also a sense of security to the population (*Waizenegger and Hyndman 2010*). While Indonesia's newly elected president had already launched an initiative to renew peace talks between the central government and GAM, it is widely believed that the disaster played a major role in bringing these talks to fruition (*Enia 2008*; *Gaillard et al. 2008*).

The post-tsunami recovery in Aceh was viewed as a historic opportunity to 'build back better', approaching both tsunami recovery and post-conflict reconstruction in a more unified way. To guard against the unequal distribution of funds, the president of Indonesia created a special agency, the Rehabilitation and Reconstruction Agency for Aceh and Nias, to rehabilitate the region not only physically, socially, and economically but also psychosocially and culturally—thereby jointly addressing the impacts of the tsunami and the conflict (*Levine et al. 2014*).

When the 2004 tsunami struck Sri Lanka, the peace process was similarly stalled, and the LTTE held a strong position. The government sought to prevent the LTTE from using the tsunami to garner international assistance (*Hoffmann and Oliver-Smith 2002*). The Tamil population believed that more assistance was delivered to people in the south, who were mostly Sinhalese, while those in the north and east, who were mostly Tamil, did not receive a proportionate share. Efforts to develop a joint response between the Sinhalese and Tamils failed. Differential treatment for people displaced by conflict and those displaced by the tsunami added to the tensions. Tamils complained that the government failed to provide adequate assistance and felt ignored and discriminated against. Inter-communal incriminations returned, and the violent conflict re-ignited in late 2006, until the Sinhalese-dominated government defeated the Tamil Tigers in 2009 (*Ferris 2010*).

Pakistan
Flood mismanagement and fragility

In the last five years, Pakistan has been one of the top 10 countries most affected by the impacts of weather-related events (*Germanwatch 2014*). Extreme rainfall in 2010 resulted in unprecedented flooding, affecting approximately 20 million people and killing nearly 2,000 (*Khan et al. 2013*).

In 2011, four weeks of continuous rain breached embankments in Sindh Province, producing economic damages estimated at 6.1 percent of its GDP (*Nawaz Khan 2010*). Sindh is one of the most multi-ethnic provinces, and its capital, Karachi, is a hotbed of ethnic, political, and sectarian violence. The 2010 and 2011 floods exposed its poorly planned drainage and irrigation projects, which exacerbated the human cost and environmental damages of the disaster. Although government efforts to mitigate the impact of the floods were substantial, they were viewed as reactive rather than precautionary steps (*Khan et al. 2013*). In addition, reports of discrimination and political bias influencing aid distribution also exposed the government's ineffective response to the floods. The inadequacy of state responses in Sindh deepened existing grievances related to the marginalization of flood-affected communities and contributed to social unrest, small-scale protests, and demonstrations (*Schilling et al. 2013*).

Glacial melting will have severe consequences for Pakistan, given that the Indus River depends on glacial waters for almost half its flow (*Laghari 2013*). In the short term, glacial melting will lead to more frequent and more intense floods; and in the long term, water flows will decrease, posing challenges for agriculture (*Kugelman and Hathaway 2009*).

CLIMATE-FRAGILITY RISKS	
Will increase if . . .	**Will decrease if . . .**
National climate-related policies and strategies are not implemented at the local level due to overlapping federal and provincial jurisdictions, leading to mismanagement and heightening community grievances. Government ministries do not coordinate with each other. Resources are captured by the provincial elites.	Governance institutions coordinate and key line ministries collaborate, increasing the capacity to respond quickly and adequately to extreme weather events. State authorities increase transparency and accountability.
The government continues to emphasize disaster response over disaster preparedness. The government is unable to adequately respond to disasters, undermining the social contract. Government compensation schemes target only landowners, leading to increased frustration among landless farmers.	Better disaster risk reduction planning improves early warning systems and disaster preparedness, increasing the resilience of local communities to disaster.
Humanitarian assistance fails to reach the most affected and vulnerable people. Humanitarian assistance inadvertently privileges one religious or ethnic community over another, exacerbating pre-existing tensions.	Coordinated humanitarian responses target the most affected and vulnerable people.
Changing water flows increase tensions with India over transboundary water use and management.	Regional cooperation increases and transboundary water management improves.
Climate-related disasters decrease water supply and quality, which is compounded by upstream pollution, fuelling grievances downstream.	Water is effectively shared at the local and provincial levels due to sustainable water resource management.

Kenya

Slow-onset droughts and security issues

Kenya's arid and semi-arid land areas, which account for 89 percent of its territory, are particularly prone to prolonged and increasingly frequent droughts (*Government of Kenya 2013*). While future climate projections vary, annual rainfall will become more variable, which is likely to increase water scarcity, degrade ecosystems, and limit farming and pastoralism (*Njiru 2012*; *IPCC 2007a*).

Over one-third of Kenya's pastoralists have already been forced to abandon their traditional lifestyle due to droughts, moving to the periphery of cities in search of emergency food aid (*Christian Aid 2006*). Droughts are stressing the capacity of the state, which is struggling to deal with both its humanitarian crisis and its insecurity, particularly crime and the Al-Shabaab terrorist group. Recent violent conflicts, such as the bandit attacks that culminated in the death of 22 police officers and civilians in Turkana County in November 2014, have brought renewed attention to the instability that can arise from dwindling natural resources (*OOSKAnews 2014*).

The small arms and light weapons inherited from the Sudanese and Ugandan war, in combination with droughts, are spurring violent crime and escalating livestock raiding into tribal conflicts (*UNDP 2011*). While livestock raids are not new, they are becoming more frequent and violent (*Eaton 2008*; *Ember et al. 2012*). Raiding reduces a community's capacity to recover from other shocks and fuels resentment and retaliation (*Schilling 2012*).

As these droughts continue, pastoralists are moving more rapidly and more frequently, sometimes crossing the Kenyan border in search of pastureland and water (*IRIN News 2009*). This movement poses a significant challenge for the Kenyan government, which struggles to provide security in the remote northern regions where porous borders with conflict-affected countries like Somalia are not easy to control (*UNDP 2011*). Combined with historical and political marginalization and physical isolation, these trends could turn pastoralist areas into neglected and lawless zones where conflict flourishes.

CLIMATE-FRAGILITY RISKS	
Will increase if . . .	**Will decrease if . . .**
Pastoralists migrate more frequently, making them more vulnerable to livestock raiding and increasing the risk of conflict.	Migration is managed peacefully, based on an understanding of how migration patterns intersect with environmental degradation. Programmes build local capacities for dialogue, mediation, reconciliation, and trust building between tribal/clan leaders of different pastoralist groups.
Drought increases food insecurity, spurring communities to engage in crime and other illicit activities that heighten community tensions.	Communities adopt sustainable and climate-proof livelihoods that increase local climate resilience. Communities have access to support services, such as cash transfers and food aid. Affected communities have access to seasonal climate forecasts, market prices, and food distribution centres.
Easy access to small arms increases violence, livestock raiding, and natural resource conflicts. The state does not provide security in remote areas, thus creating a vacuum that is filled by non-state security actors.	The amount of small arms is controlled or reduced. Dialogue, trust, and peace agreements are promoted at the community and regional levels.
Natural resource allocation is inequitable and fails to target marginalized tribes or communities. Government environmental and conservation policies deny vulnerable groups access to water and land.	Pastoralists are engaged in dialogue and policies to remedy historical, physical, and political marginalization. Governments invest in climate-proof and conflict-sensitive water infrastructure projects that provide a new lifeline for nomadic communities.
Local elites manipulate aid distribution, fuelling resentment and distrust between the state and citizens or between communities.	Humanitarian aid is deployed in a transparent, accountable, conflict-sensitive way to communities affected by conflicts. Beneficiaries receive accurate and timely information.

2.5 Volatile food prices and provision

Climate change is highly likely to disrupt food production in many regions, increasing prices and market volatility, and heightening the risk of protests, rioting, and civil conflict.

Climate change is highly likely to decrease yields and disrupt food production in many areas. Combined with increasing global pressures—including population growth and changing energy demands—food insecurity is likely to increase and food prices are likely to become more volatile. As exemplified by the 2007–9 food riots in more than 40 countries, food price volatility and higher prices can increase the risk of public unrest, democratic breakdown, and civil and local conflict, particularly when combined with poverty, poor governance, and a weak social contract. Countries that depend on food imports and where households spend a significant proportion of their income on food are particularly vulnerable. However, the likelihood that food insecurity contributes to instability depends not only on local factors, such as the degree of urbanization and market access, but also on national policies, such as consumer subsidies and export markets.

VOLATILE FOOD PRICES AND PROVISION	
What is the risk?	Climate changes interact with other drivers of food price volatility, such as high energy prices and population growth, to increase the risk of price inflation. Sudden price spikes spur protests, rioting, democratic breakdown, and civil conflict, especially in urban centres. The risk of large-scale violence increases during political transitions or against a backdrop of long-term oppressive regimes.
Tipping points	• Consecutive adverse weather events, such as droughts or floods, occur in more than one major grain-exporting nation. • Key grain-exporting nations impose export bans. • Consumer subsidies are cut without sufficient safeguards to protect the poorest people.
Entry points	• Ensure that data and analysis provide a solid evidence base for policy decisions. • Ensure that when food prices fluctuate to potentially critical degrees, adequate reserve food stocks provide food security. • Keep the market operating during food price crises and reduce trade barriers. • Encourage more collaboration between food programmes and peacebuilding to ensure that humanitarian assistance does not undermine food security in the long run.

Global pressures — including population growth and changing energy demands — drive price volatility and food insecurity

Trends such as climate change, population growth, increased consumption by the global middle class, rising energy prices, and the growth of biofuel energy sourced from food crops are creating new pressures on food supply and prices. Other drivers of food price volatility include demand for

a more varied diet (especially in middle-income countries in Asia), a lack of access to fertilizers and other agricultural inputs, weak governance, and poor management of natural resources. Mechanisms that analyse and manage the major food crop markets should include these factors to provide early warning of future shocks (*FAO and OECD 2011*).

Higher food prices can increase the risk of violence and instability

While higher food prices do not always lead to social and political unrest, empirical analyses substantiate the numerous ways in which food insecurity can trigger, fuel, or sustain conflict. Unanticipated or higher-than-normal increases in food prices are likely triggers for unrest, though the potential for protests to become violent depends on contextual factors. However, there is less evidence linking food insecurity to interstate conflicts (*Brinkman and Hendrix 2011*; *Simmons 2013*).

The links between climate change, food prices, and food riots are complex. They depend on the responses of multiple private and state actors and on important contextual factors, such as poverty and the level of urbanization (*IPCC 2014*). For example, the 14 countries in Africa that experienced food riots in 2008 had higher levels of poverty, less access to food, more urban areas, more oppressive regimes, and stronger civil societies than those countries that did not experience riots (*Berazneva and Lee 2013*). Food insecurity at the national and household levels has been found to be a major cause of conflict in Arab countries, more so than in the rest of the world (*Breisinger et al. 2012*).

These complex factors — the conflict context, economic and political stability, the legitimacy of political institutions, social safety nets, demographic pressures, and government responses — shape the risk that high food prices will lead to conflict. The risk of conflict is higher where autocratic regimes collide with democratic regimes during periods of transition, or when a country has low levels of economic development, high levels of inequality between groups, or a youthful age structure (a 'youth bulge') (*Simmons 2013; Brinkman and Hendrix 2011*). Inappropriate or badly designed government responses can exacerbate these risks.

Higher food prices affect households, countries, and regions differently

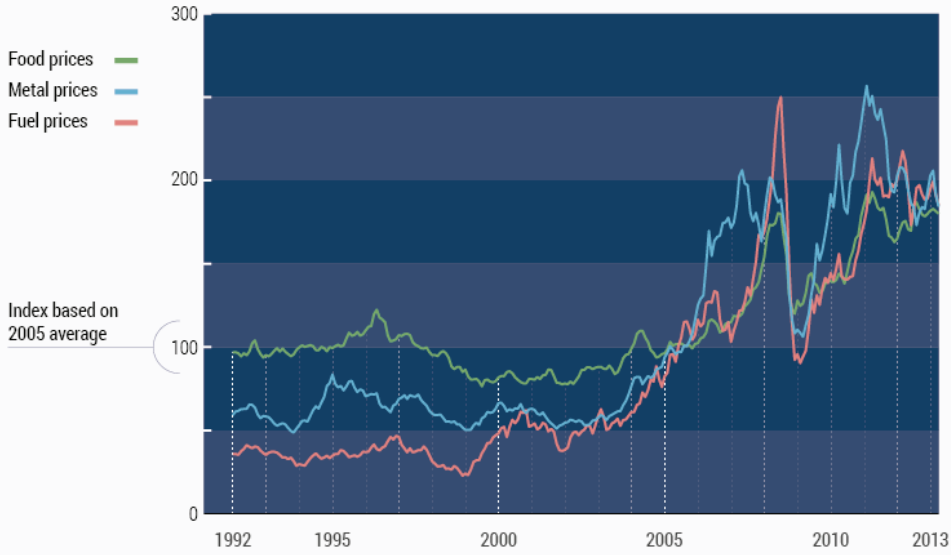
The risk of instability increases if ethnic or social groups believe that high food prices are disproportionately affecting them, especially in places where there is a history of grievance or tensions between groups. Relative deprivation generates grievances that motivate violent behaviour. Gauging risk requires assessing the average levels of food insecurity and whether it is widely experienced or concentrated among certain groups. At the sub-national level, inequality can create or entrench pockets of fragility. When inequality is more pervasive at the national level, the risk of large-scale violence increases (*Brinkman and Hendrix 2011*).

Climate change also poses a risk to the global food production and value chains. Corresponding local or national declines in food production may have a negative impact on many other parts of the world (*Gregory et al. 2005*). Urban residents rely heavily on food supplies from rural areas. Most documented examples of food-related instability occur in cities, but most agricultural policies are targeted at rural residents (*Hendrix and Haggard 2015*).

Food price volatility will be spurred in part by the effects of climate change on food production

Climate change is affecting the quality and quantity of global food production and is threatening food security globally. Higher temperatures may increase yields in higher latitudes, but lower latitudes — where most developing countries are located — will feel the negative impacts immediately. Increases in the frequency and severity of extreme weather and climate-driven water scarcity will also decrease food production (*IPCC 2014*). Furthermore, disasters such as droughts, flooding, and coastal surges will cause significant damage to crops. Severe droughts in 2011 and 2012 across China,

The commodity super-cycle



The commodity super-cycle that began at the end of the 1990s pushed commodity prices to record highs. Prices for fossil fuels, metals, minerals, and food tripled between 2000 and 2010, raising the global value of natural resources from US$1.5 trillion to almost US$5 trillion (*Lee et al. 2012*). This super-cycle was mainly driven by the increasing demand of economies growing worldwide, especially emerging economies such as China and India. Prices have been highly volatile since 2008. In 2013 and 2014, prices for many commodities fell significantly, especially for oil, but also for gold and industrial metals such as copper, aluminium, and zinc (*World Bank 2015b*). Whether the commodity super-cycle has come to an end and prices will decrease in the coming years is a subject of ongoing debate (*World Bank 2014a*).

However, a number of structural trends point towards continued volatility:

- Globalization (e.g., outsourcing and just-in-time delivery) has increased efficiency but reduced robustness to supply shocks (*World Economic Forum 2012*).
- Commodity prices have become more interdependent. Price spikes in the oil and gas sector, whether caused by weather events or political crisis, affect prices of food and other sectors that rely on oil and gas, transmitting shocks across the system (*World Bank 2014a*).
- New energy resources are more expensive and harder to extract. More extraction is now taking place in fragile regions, increasing political risks and making it harder to quickly increase supply. This supply inelasticity is one of the main drivers of price volatility (*World Bank 2014a*).

› Data from IMF (2014)

the US Midwest, Eastern Europe, parts of Russia, Ukraine, and Kazakhstan pushed food prices higher. At the same time, climate change poses a serious challenge for increasing productivity, which is necessary to meet the increasing demands of a growing world population (*Lobell and Gourdji 2012*).

Expected changes in the intensity, frequency, and seasonality of climate patterns and extreme events, sea-level rise, glacial melting, ocean acidification, and changes in precipitation and groundwater and river flows will have serious consequences for fisheries and aquaculture in many places.

Fisheries are key components of economic growth, poverty reduction, and food security in many regions and countries, particularly the Caribbean small island states, Southeast Asia, and such coastal African states as Namibia, Uganda, Ghana, and Senegal. Sustainable fisheries management in the face of climate changes would contribute greatly to regional stability (*FAO 2009; IPCC 2014*).

States that depend on food imports and spend a significant proportion of their household income on food are particularly vulnerable to higher food prices

Import-dependent countries, such as most of the countries in the Middle East and North Africa, are more sensitive to high food prices. If food prices rise, governments are burdened with an unmanageable balance-of-payments deficit because the cost of food imports significantly outweighs the revenue from exports. For example, Egypt's dependence on climate-sensitive wheat from China and Russia contributed to its instability when wheat crops failed due to drought (*Werrell and Femia 2013)*. In resource-scarce and import-dependent countries such as Jordan, export policies are poorly aligned with resource management strategies. Jordan produces a large volume of low-value, water-intensive crops for export, increasing its dependence on imports and leaving the national government and consumers vulnerable to food price spikes (*Grover et al. 2010*). Risks are often more pronounced for the urban poor, who may not have access to kitchen gardens (*International Alert 2014*).

Within households, women and children are more likely to suffer more food insecurity than men due to physical, socio-cultural, and economic constraints on accessing resources. Certain customs and norms may dictate that men and young boys are given more food than girls (*FAO and ADB 2013*).

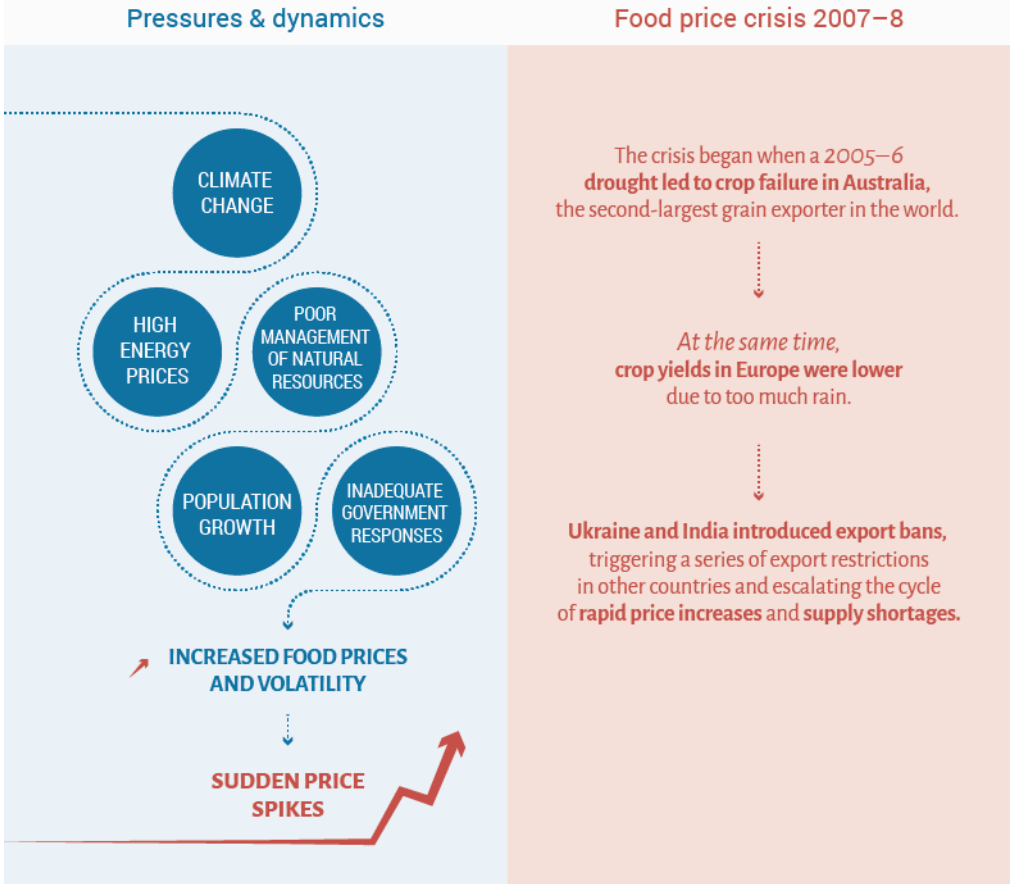
Protectionism and other measures to safeguard the security of supply will increase

Many countries are confronting the challenges of the commodity super-cycle and global price volatility (see boxes on page 44 and 46) by establishing policies to manage the problem. Some seek to increase their security of supply by agreeing to liberal trade rules or mutually beneficial agreements between producing and consuming countries. However, many countries have chosen to act unilaterally and serve their own national interests. Some have increased protectionist measures, such as tariffs and export bans, while others are seeking to increase their own access to resources in other countries. Many countries, such as India, are focusing on increasing domestic production to avoid over-relying on volatile markets. To keep the global food market functioning, countries should avoid export bans and ensure a regionally coordinated response during times of food shocks (*Headey and Fan 2010*).

Violent conflict contributes to higher food prices

Because conflict can disrupt the ability to produce, distribute, access, and trade food, it can increase food prices. Conflict renders large swaths of arable land too dangerous to cultivate and drives away farmers. For example, after 30 years of civil war in Sri Lanka interrupted farming in the country's northern and eastern regions, the traditional strategies used by farmers to cope with environmental changes were lost. Conflict and political instability also degrade the willingness of farmers to plan for the future or make changes to their behaviour, reducing their resilience to climate change, even where alternative options are available (*Vivekananda et al. 2014*). Violent conflict can disrupt markets, infrastructure, and supply chains, causing a breakdown in the production and distribution of food. Parties to conflict may also use food insecurity as a weapon of war—for instance, by hijacking food aid intended for civilians or by cutting off access to food supplies. They may intentionally or incidentally destroy crops, livestock, land, and water (*Messer et al. 2002*).

Global food crises



The 2007–8 and 2010–11 global food price crises were created by the complex interplay of demand trends, such as the growth of biofuels, and short-term pressures, including the rise of oil prices, crop shortfalls from extreme weather and climate-related events, export restrictions, and panic buying (*Headey and Fan 2010*; *European Commission 2011*; *UN-DESA 2011*).

The crisis began when a 2005–6 drought led to crop failure in Australia, the second-largest grain exporter in the world. At the same time, crop yields in Europe, especially Ukraine, were lower due to too much rain. Ukraine and India introduced export bans, triggering a series of export restrictions in other countries and escalating the spiral of rapid price increases and supply shortages (*Headey and Fan 2010*). Following the 2008 food crisis, 30 countries introduced protectionist policies to reduce or stop exports of commodities (*Lee et al. 2012*).

Protectionist measures not only reduce the global security of supply but also create feedback loops that exacerbate the perception of risk in other countries. In 2010 and 2011, droughts and fires in Russia decimated 13.3 million acres of crops. The government banned wheat exports to secure national supplies, which pushed the international price of wheat from US$250 per ton in August 2010 to US$325 in January 2011 (*Welton 2011*). Some countries lost so much trust in international markets that they took steps towards self-sufficiency, despite warnings from the UN Secretary-General's food task force that self-sufficiency and food security are not the same (*Dapice 2011*). Often, this focus on domestic production and stocks leads to policies that undermine agricultural growth and decrease the incomes of small farmers cultivating non-essential food crops, thus failing to effectively reduce food insecurity (*High-Level Task Force on the Global Food Security Crisis 2008*).

© adelphi

› **Sources:** Headey and Fan (2010); Lee et al. (2012)

Energy and food prices are intertwined

Energy production and use affects food prices in multiple ways, such as by increasing the costs of fertilizer, fuel for farm vehicles and machines, and transportation to markets. The trend of using food crops to produce biofuels has driven food price increases in recent years (see Chapter 2.8, 'Unintended effects of climate policies'). Energy demands create competition between food crops and biofuel crops. Switching from food to biofuel crops displaces food production and consequently drives up food prices (*Evans 2009*).

Food subsidies can help governments alleviate domestic discontent, but they are inefficient and their removal can spark conflict

While government subsidies can help protect the poor from rising prices, governments must bear the opportunity cost of financing those subsidies through deficits or by raising additional taxes. Emergency subsidies can play a useful role, but if they become the norm, the situation can be more difficult. In fragile contexts and low-income countries, maintaining subsidies can be expensive (*Andrews et al. 2012*). Moreover, recent research highlights the importance of government policies and pricing in connection with a range of conflict outcomes. Governments in developing countries often fail to direct subsidies to those most in need. They frequently use subsidies to raise prices for domestic producers at the expense of consumers, or they favour subsidies for urban consumers, thereby reinforcing rural/urban inequalities (*Hendrix and Haggard 2015*).

Subsidies also create new expectations and in many cases become part of the social contract. When economic resources are sufficient, subsidies earn governments political capital. However, they become burdensome when resources dwindle and people suffer a sharp decline in their standard of living. Removing subsidies in such situations can lead to instability and violence (*Patel and McMichael 2009*). The so-called 'bread riots' broke out in Egypt in January 1977 after bread prices increased sharply in the wake of reduced subsidies urged by the International Monetary Fund and the World Bank (*Gutner 1999; Sachs 2012*).

Food price riots can be used as a political tool to register people's discontent against repressive or corrupt governments

In the 2008 anti-government riots in Cameroon, protesters expressed their anger over high food and fuel prices, as well as the president's attempts to change the country's constitution to prolong his mandate. In Haiti, protesters rioted over rising food prices in 2008, demanding the removal of their president. In the 2008 food riots across 48 countries—including Bangladesh, Haiti, Pakistan, Burkina Faso, and Mexico—food and fuel inflation combined with other political grievances and dissatisfaction to lead to violence or civil unrest (*Evans 2010*).

Egypt
The 2011 political crisis and bread riots

On January 25, 2011, the Egyptian population took to the streets to protest the nearly 30-year-old Mubarak regime. They objected to the regime's oppression, the lack of freedom of speech, corruption, unemployment, wages, and food price inflation. While these factors were not new to Egypt, many commenters have identified an increase in poverty coinciding with sudden food price spikes as a core driver of the protests (*Werrell and Femia 2013*).

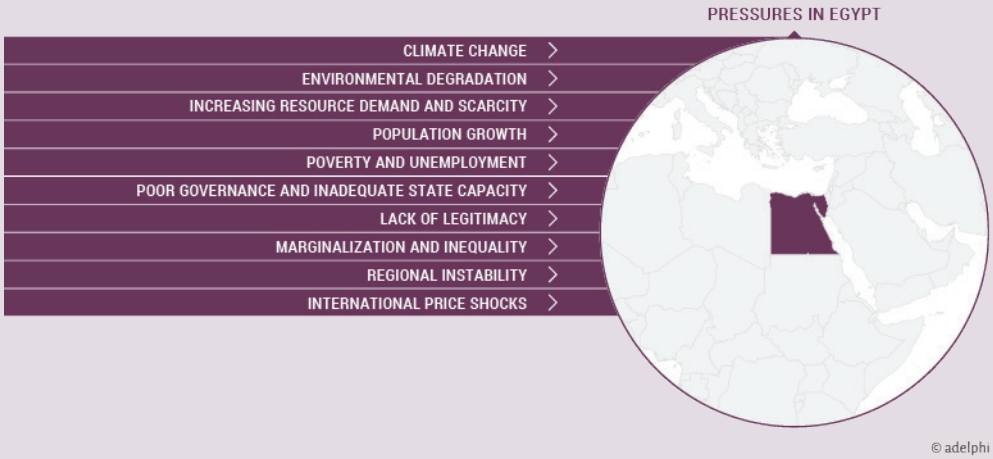
The conflict risk posed by high or volatile food prices is highly context-specific. In Egypt, soaring food prices acted as a catalyst. However, they were neither a necessary nor sufficient condition to explain the violent civil unrest in 2011 and 2013 (*Hendrix and Brinkman 2013; Simmons 2013*).

As one of the world's biggest wheat importers, Egypt is highly vulnerable to food price shocks. Only 4 percent of Egypt's territory is suitable for agriculture, water scarcity is increasing, and the country's population is growing. Climate change is projected to decrease rainfall by more than 9 percent in the central parts of the country, threatening the Nile River. A total of 80 percent of the country's water is used for agriculture (*World Bank 2015a*).

Egyptian households spend more than 40 percent of their income on food and are therefore highly sensitive to food price fluctuations, particularly in urban areas like Cairo, where the protests broke out (*WFP 2013*). Egypt has a long-standing tradition of subsidizing food, especially wheat, to counter recurrent shocks and maintain political stability. With nearly 18 percent of the Egyptian population suffering from food insecurity, this food supply system has reached its limit, and the crises in 2008 and 2011 have underscored the government's inability to ensure sustainable food security for its people, eroding its legitimacy (*WFP 2013*).

The food subsidies were criticized for being costly and inefficient. In 2008–9, the fiscal cost of food subsidies accounted for 2 percent of GDP. In addition, 28 percent of food subsidies did not reach the most vulnerable households (*World Bank 2010*). At the macro level, government subsidies widened the budget deficit and deepened Egypt's dependency on external investors. Political instability in Egypt cut foreign investments and reduced tourism, expanding the finance gap, which made it difficult to implement the necessary reforms (*IMF 2014*).

The recent reforms undertaken by the Egyptian government are a good step. The government could increase spending on health and education, and the new conditional cash transfers will improve the likelihood that the aid will reach the most vulnerable households and enhance the social contract between the state and its citizens.



© adelphi

Jordan

Food and water scarcity, refugees, and conflict

As one of the most water-stressed countries in the world, Jordan relies on food imports and faces the double threat of water scarcity and energy insecurity as its population grows. Its extremely low water prices encourage wasteful consumption (*EBRD 2012*). Jordan is now home to more than 600,000 Syrian refugees, living in urban areas or refugee camps and straining government services, the economy, and scarce groundwater (*UNHCR 2015*). Tensions between refugees and host populations over food, jobs, health care, education, and housing are also rising. Jordan loses up to 50 percent of the water pumped into its networks (*MWI Jordan 2008; Al-Ansari et al. 2014*). In addition, its severe water scarcity is expected to be exacerbated by climate change, which will be a major constraint on growth and development. Climate change could also potentially exacerbate the ongoing conflict with Israel and the Palestinian Territories over water rights, which in turn could render existing peace agreements untenable and complicate the negotiation of future agreements (*Brown and Crawford 2009*). Jordan's energy resources are also limited, forcing it to rely on imports and pay high energy import bills (*International Alert 2014*).

CLIMATE-FRAGILITY RISKS	
Will increase if . . .	**Will decrease if . . .**
Jordan continues to export low-value and water-intensive crops, leading to a negative trade deficit and increasing water insecurity.	Agricultural policies discourage the production of water-intensive, low-value, and low nutrition crops in favour of water-saving, high-value, climate-resilient crops.
Poor infrastructure and water mismanagement lead to higher water and food prices, increasing frustration, especially among the rural poor.	Infrastructure investments reduce water losses and thefts. Water is better managed, including the use of grey water.
The refugee camps' demand for water depletes water resources and increases local prices, fuelling resentment in host communities.	The camps adopt sustainable water and energy plans and plant kitchen gardens,thus decreasing water demand.
The removal of food subsidies provokes a rise in food prices, triggering violent protests.	The poorest and most vulnerable populations are protected by targeted support, and the government spends subsidy funds on health and education.
The government is unable to import necessary quantities of food or energy because it is unable to pay imports or because major exporting states have imposed embargoes, leading to higher prices and disrupting supplies.	The government promotes climate-smart, low-water, high-nutrition, and high-value crops to decrease water demand. The government manages national debt, avoids expensive new infrastructure projects, and maintains financial reserves in case of potential food spikes.

Myanmar
Rice price volatility

In Myanmar, rice is a main source of nutrition and income for the majority of the population. Households spend up to 50 percent of their income on rice, while more than 50 percent of the population depend on rice for their livelihoods (*World Bank 2014b*).

Myanmar is also extremely vulnerable to climate change, particularly the increase in extreme weather events. Cyclone Nargis in 2008 was the second-deadliest named cyclone of all time. The agricultural sector, which contributes more than 36 percent of national GDP, is particularly at risk, threatening the country's economic growth (*World Bank 2014b*). Higher temperatures and changes in precipitation will decrease the quantity and quality of rice production. Climate change will also cause short-term crop failures, which disproportionately affect low-income rural populations that already feel marginalized by the central government (*Government of Myanmar 2012*).

Rice prices rose by 40 percent between 2009 and 2013. Myanmar's price volatility is the highest among net rice-exporting countries in Asia, and is mostly driven by seasonality, along with the lack of transportation and storage infrastructure, unreliable market information, and low export diversification (*World Bank 2014b*). This volatility prevents rice farmers from earning high profits due to the uncertainty it creates, keeping many farming families in poverty. In recent years, farmers in Myanmar have tried different strategies to counter this trend, such as using irrigation to enable a second rice harvest and developing a modern meat production system and food processing industry (*German Embassy Staff, interview*).

CLIMATE-FRAGILITY RISKS	
Will increase if . . .	**Will decrease if . . .**
National schemes to shield people from rising food and energy prices are not effective, due to corruption or delays.	A balance is struck between short-term measures and long-term investment in agriculture and transportation infrastructure. Social protection schemes target the most vulnerable populations in a timely fashion.
Rural marginalized communities are denied access to booming economic growth. The open economy increases vulnerability to external shocks, including international food price increases.	Economic opportunities are equitably distributed to different socio-economic and ethnic groups. The democratic opening is leveraged to engage communities in discussing their options and plans for the future.
Transitional governments use rice prices as a political tool to gain support around election times. Food price spikes coincide with periods of political transition, such as elections.	The government is able to store reserves to protect against sudden shocks. A regional food reserve provides an extra layer of safety.
Extreme weather events lead to higher food prices, increasing food insecurity and displacing people, which exacerbates communal violence and religious and ethnic conflicts.	The government is able to manage tensions between internally displaced persons and host communities. Humanitarian aid for refugees is conflict-sensitive and does not become the focal point for local grievances.
Marginalized rural populations are more affected by rising food prices due to poor transportation infrastructure.	The government invests in climate-proof infrastructure (e.g., post-harvest storage and roads). Telecommunication systems increase market access in rural, marginalized areas.
Investments in non-sustainable energy sources such as biofuels increase food staple prices.	The government coordinates water, food, and energy policies, ensuring that national energy policies and strategies do not have unintended trade-offs for food security.

2.6 Transboundary water management

Transboundary waters are frequently a source of tension; as demand grows and climate impacts affect availability and quality, competition over water use will likely increase the pressure on existing governance structures.

The management of shared water supplies can provide both opportunities for collaboration between governments and serve as a source of tension. Many transboundary river basins are located in regions with a history of armed conflict and significant interstate tensions. Historically, states have not fought 'water wars'. Yet competition over water use will likely increase in many areas as demand grows and climate changes affect availability, so past experience may not predict the future. Managing the fragility risks posed by climate change will be particularly complicated in transboundary basins affected by fragility or conflict, where water management is often eclipsed by political considerations or affected by power asymmetries.

TRANSBOUNDARY WATER MANAGEMENT	
What is the risk?	As demand grows and supply decreases, the stakes for growing populations and economies will also increase. Existing transboundary governance mechanisms might not be able to manage disputes. Countries might decide to unilaterally change water flows. The development of water infrastructure in transboundary river basins could be especially conflictual, as new dams can change the power balance in a basin.
Tipping points	• New dams change the balance of power and provoke pre-emptive action. • New countries with limited experience negotiating water agreements face rapid changes in water availability, partly due to climate change. • Prolonged droughts and strong floods influenced by climate change may also be attributable to neighbours' water infrastructure or use. • Political and economic crises occur at the same time as dam building or droughts and floods.
Entry points	• Ensure high-level diplomatic action in transboundary basins to foster cooperation and strengthen basin governance. • Enhance knowledge and strengthen local institutions for water management. • Foster cooperation through an international mechanism focusing on regional cooperation.

Water competition in transboundary river basins is likely to increase, potentially spurring conflict

Almost every country with land borders shares some waters with its neighbours in international river basins. These basins cover 46 percent of the Earth's land surface and account for approximately 60 percent of global river flow (*UN-Water 2008; UN-Water 2014*).

Many important transboundary basins—the Nile, the Indus, the Ganges, the Euphrates-Tigris, the Amu Darya and Syr Darya, and the Mekong—overlap with regions characterized by substantial tensions and a history of armed conflict (*Pohl et al. 2014*). Although systematic academic research shows that shared waters have induced cooperation more often than conflict, the limited historical precedents for interstate 'water wars' should not lead to complacency (*Wolf et al. 2003*).

HEAT MAP
Where is the highest risk of water conflict?

HOTSPOTS

1

By the end of 2015, Turkey expects to complete the Ilisu Dam on the Tigris River, part of a national push to boost electrical power capacity. Besides submerging the 12,000-year-old settlement of Hasankeyf, the dam may damage the already fragile Mesopotamian marshes downstream in Iraq, Germany, Austria, and Switzerland withdrew funding for the dam in 2009.

2

Tajikistan is planning the Rogun hydroelectric dam on a tributary of the Amu Darya river. The dam would be the tallest in the World and help alleviate the country's energy shortages. Uzbekistan, fearing irrigation shortfalls, has imposed tariffs and travel restrictions on its neighbor to the east.

3

In 2011, Ethiopia began building the Grand Renaissance Dam on the Blue Nile, a tributary that provides about 60 percent of the Nile's water. Egypt and Sudan are concerned about the dam's effect on water flow downriver. Ethiopia says it will finish the project in 2017.

4

In a channel of the Mekong two miles north of the Cambodian border, Laos intends to construct the Don Sahong Dam. The power project could affect fishing in Cambodia, Vietnam, and Thailand, so those countries are demanding a say in the plan.

The color of each international river basin indicates the total number of interactions there from 1990 to 2008.

None | 1–3 | 4–15 | 16–40 | 41–126 | 127+

Circle size indicates the number of hostile events in each basin.

1–2 | 3–6 | 7–15 | 16–45 | 46+

Map reproduced from the June 2014 issue of Popular Science courtesy of Katie Peek. Data visualization by Pitch Interactive.

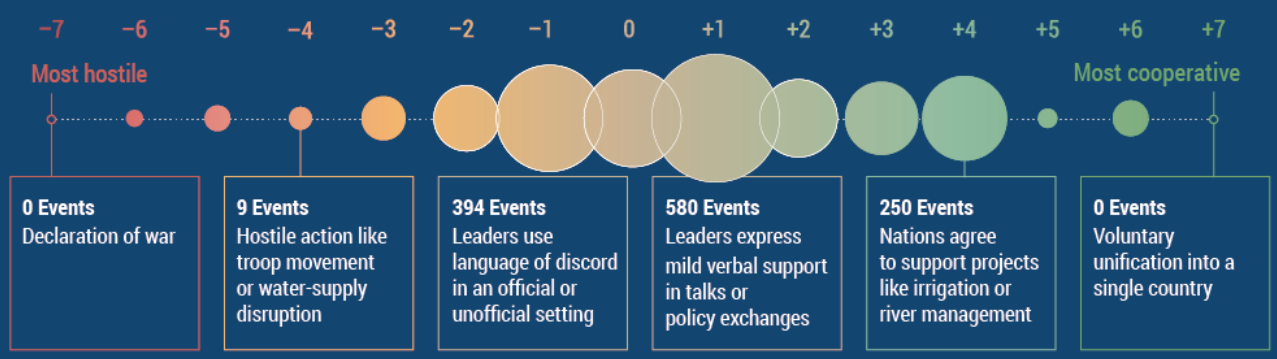
Map based on the Transboundary Freshwater Dispute Database by the Department of Geosciences, Oregon State University.

WATER: A map on conflict and cooperation

This map shows almost 2,000 incidents related to conflict and cooperation in transboundary basins that took place between 1990 and 2008. The coloured circles include an additional 200 disputes over resources other than shared water resources. Overall, there were approximately twice as many cooperative events as conflictual events during this period. Circle size does not automatically translate into conflict danger, as the circles illustrate the total number of events with varying degree of hostility. However, when external events overwhelm institutional coping mechanisms, conflict becomes dangerous *(Wolf et al. 2003)*. This is reflected in the hotspots on the map, which coincide with regions where resilient conflict resolution mechanisms are absent. In the Danube River basin, for example, conflictual events were mitigated by the presence of strong cooperation incentives, embedded in the process of European integration *(Pohl et al. 2014)*.

EVENTS BY INTENSITY

The researchers graded each exchange on a 15-point scale. Collaborative interactions outnumber hostile ones.



Many international basins will face increasing demands for water due to population growth, industrialization, and urbanization. As pressures and demands increase, so do the stakes for states to secure their own access. The incentives and opportunities for exploiting water resources in a unilateral manner may also increase (*Pohl et al. 2014*).

Water supply will be further squeezed by the effects of climate change, leading to greater trade-offs and undermining water-sharing institutions

Climate change will alter the access to and availability of transboundary waters. Managing these risks will be particularly complex in transboundary basins. Changes in water supply increase the stakes for diverting water. At the same time, climate change provides a rationale for countries to aggressively develop their water resources and restrict access for others. The need to mitigate climate change also incentivizes developing clean energy sources, including hydropower. Building dams and other water infrastructure often requires cross-sectoral trade-offs, such as balancing the need for clean hydropower and flood protection against lower agricultural yields and threats to freshwater fisheries. The redistributive effects of these trade-offs might fuel both local and intergovernmental grievances (*Pohl et al. 2014*).

Adding water storage capacity in the Indus River basin, for example, could mitigate the impact of extreme events, such as the devastating 2010 floods in Pakistan that left 20 million people homeless (*Meyerhoff 2014*). Storage capacity connected to a hydroelectric plant could also add energy supplies to overburdened national networks. But the operational demands of flood control, hydropower, and dry-season irrigation demands often vary, which makes choosing among these demands politically difficult. In the case of the Indus basin, the potential of such water infrastructure is further hampered by the Indus Waters Treaty, which assigns the use of different tributaries to India and Pakistan. This leaves Kashmir, for example, smarting from its inability to tap into 'its' rivers in a fragile region that is already particularly vulnerable to the effects of climate change (*Swain 2013*).

The variability and uncertainty induced by climate change threaten existing water-sharing institutions, which are often based on the allocation of specific amounts of water that may simply not be available in the future. Yet these institutions are crucial for preventing and mitigating conflict (*Wolf et al. 2003*). Climate change might not only add to existing pressures but also trigger conflict by undermining existing conflict management institutions.

Local conflicts over water could spur international disputes

As supplies decrease, transboundary water resources may be considered security assets. Unsustainable water use may increase pressure on governments to protect their 'national' water, and the local natural resource conflicts described in the first section could become international. In 1989, for example, Senegal and Mauritania almost went to war after a local conflict between farmers and herders killed more than 100 people (*Uppsala Conflict Data Program 2014*). Conflicts could also arise over foreign direct investments in other countries' natural resources. For example, Chinese investment in dams in neighbouring Myanmar (e.g., the huge Myitsone Dam on the Irrawaddy River) has heightened ethnic tensions and strained relations between the two countries (*Peel 2014*).

Dam development leads to upstream–downstream conflicts

The development of large-scale water infrastructure can be especially conflictual. The development of dams can change access to water in a very short period. These changes can alter the balance of power both within and between countries (*Pohl et al. 2014*). The expansion of irrigation in upstream countries, to the detriment of downstream ones, could push those that are downstream to pre-empt construction. They might build water infrastructure of their own or claim water supplies through armed conflict. With at least 3,700 major new dams planned or under construction worldwide, these risks are widespread (*Zarfl et al. 2015*). Syria and Iraq, for example, cannot prevent Turkey from reducing their water resources in the Euphrates. This uncertainty could fuel grievances and discontent, and make it even more difficult to end the ongoing violence in both countries. The fear that Turkey's dams on the Euphrates River might aggravate the loss of agriculture has already been used by the Islamic State to issue threats to 'liberate Istanbul' (*Meynen and Temper 2014*).

Conflicts of interest over water access may be used for political purposes and reinforce existing social or international cleavages

The risk of conflict is not necessarily a direct function of water scarcity, but of the politics surrounding competing interests. For example, a dispute over the Ganges River between India and Bangladesh was repeatedly used by politicians in both countries as a diversionary conflict (*Swain 1996*). Similarly, accusing Turkey of withdrawing water might be politically convenient for both the Iraqi government and the Islamic State.

Fragility may also be an indirect by-product of uncertainty about future access to water, which could, for example, deter investment and stymie economic growth. Blaming outsiders is often politically more convenient than adapting a country's political economy and taking on vested interests. Yet because blame games do not lead to sustainable solutions and instead divert political attention from substantive problems, they tend to entrench fragility dynamics across transboundary river basins (*Uprety 2014*).

The Nile River basin

Climate change, overconsumption, and upstream development

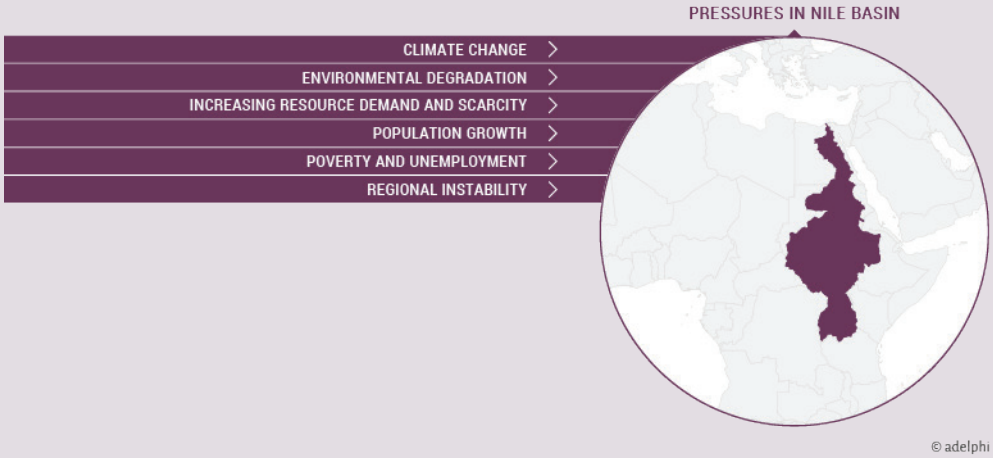
The Nile River basin's richest and most powerful riparian, Egypt, is also its most downstream country. Egypt's current water demands exceed its sustainable supplies by 25 percent, while its population is slated to grow from 87 million to 113.6 million by 2030 (*Strategic Foresight Group 2013*). Egypt's high levels of consumption have already contributed to salinization, as too little water reaches the Mediterranean Sea to flush out salts (*Di Nunzio 2013*).

Historically, Egypt's relative power, as well as the upstream countries' lack of access to finance, prevented the other riparians from constructing large dams that could have decreased Egypt's supply. Yet demographic and economic developments are increasing the pressure on upstream countries to develop their water resources. Demand for water in the Nile basin states is slated to grow as the population increases from 424 million in 2010 to 648 million in 2030 (medium projection, *Nile Basin Initiative 2012*). Harnessing the potential of the Nile's water is seen by many poorer upstream countries as essential to overcoming their current economic weakness (*Nile Basin Initiative 2012*; *Gebreluel 2014*).

Today, the balance of power is shifting upstream due to population and economic growth, state consolidation, and development progress. Upstream countries have also profited from geopolitical changes and alternative sources of capital for major infrastructure investments, breaking Egypt's de facto veto power. This shift became palpable when the Ethiopian president announced the construction of a huge new dam, the Grand Ethiopian Renaissance Dam, on the Blue Nile in February 2011 at the peak of Egypt's political instability (*Whittington et al. 2014*). The filling of the Renaissance Dam will accelerate the gradual process of salinization, producing a significant shock when millions of Egyptians lose access to the water on which their livelihoods depend and there is less water to counter catastrophic salinization in the Nile Delta. The Morsi government directed belligerent rhetoric towards Ethiopia, presumably to foster internal political support. The subsequent regime has refrained from threatening war (*Kantor 2014*).

Climate change's contribution to the current conflict in the Nile basin is still limited. However, the current pressures demonstrate how the impacts of climate change might play out in the future, since the disruption caused by dam building is similar to the predicted disruptions from climate change. Climate change is likely to result in greater variability in seasonal flows. Increased consumption is likely to lead to reduced flows downstream, with several consequences, including relatively less available water and increasing salinization (*Link et al. 2012*).

These changes will significantly increase both the pressure on Egypt's food and water security and the risks of fragility. Given past blame games between upstream riparians and Egypt, there is a real risk that the Egyptian government may take refuge in nationalism and seek to prevent further upstream water infrastructure development by force, such as supporting rebel groups or fostering political destabilization. Many upstream riparians are vulnerable to pressure from Egypt and already face fragility challenges of their own. Alternatively, Egypt may succeed in enticing the South Sudanese government to build canals on parts of the White Nile or its tributaries to increase flow downstream (*Pearce 2015*). Work on such a project in the 1980s contributed to the renewed outbreak of civil war in today's South Sudan (*Swain 2011*). Finally, Egypt could leverage different upstream riparians (e.g., Eritrea and Ethiopia) against each other, contributing to fragility in the region.



The Indus River basin and access to water

The Indus River basin is the most often-cited example of international cooperation over water. After India and Pakistan split violently in 1947, negotiations over the river's waters proved difficult. But with the help of the World Bank, Pakistan and India signed the Indus Waters Treaty in 1960 (*Zawahri 2014*). The bilateral Permanent Indus Commission, which is tasked with implementing the treaty and negotiating any issues that arise, has fulfilled its requirement to meet every year, even when diplomatic relations between the two states have been suspended (*Thatte 2008*).

However, the relative stability of intergovernmental cooperation hides deep cleavages at the subnational level that have fed violent conflict in both India and Pakistan, and which may yet destabilize Indo-Pakistani relations. In the electricity-starved Indian state of Jammu and Kashmir, for example, the state legislature in 2002 called for the annulment of the Indus Waters Treaty in a near-unanimous resolution because it assigns the three rivers running through Jammu and Kashmir to Pakistan (*Swain 2013*).

In Pakistan, 90 percent of the country's food and 65 percent of its employment depend on agriculture in the Indus River basin (*Pohl et al. 2014*). With water demand rising due to significant demographic growth, agricultural livelihoods are at risk, particularly in downstream Sindh Province, because the more powerful upstream province of Punjab diverts more water to its growing cities (*Mustafa et al. 2013*). Climate change has quickened the melting of the Himalayan glaciers, and flooding seasons are shifting. The devastating floods of 2010 demonstrated the political risks that can result from extreme weather events (see the Pakistan scenario in Chapter 2.4).

The increasing competition over water is closely intertwined with issues of asymmetric political power and incentives for political leaders to deflect blame rather than resolve conflicts. As the pressures on the basin are rising, so too are risks related to livelihoods, food price volatility, and the lack of government legitimacy, which could conceivably feed into a dangerous intergovernmental stand-off.

CLIMATE-FRAGILITY RISKS	
Will increase if . . .	**Will decrease if . . .**
Crucial provisions of the Indus Water Treaty are ignored. Environmental changes disrupt the viability of the inflexible water-sharing agreement between India and Pakistan.	India and Pakistan collaborate more closely, either by formally amending the treaty or by informally supporting practices that optimize the use and distribution of scarce water.
Inter-provincial conflicts in Pakistan escalate in the face of greater demands and earlier floods, leaving Sindh and Karachi with even less water during the summer months.	Better mechanisms for inter-provincial equity in water sharing are established. Investments in new infrastructure strengthen downstream resilience.
Governments' responses to floods are inadequate or inequitable, creating or exacerbating local grievances and undermining the social contract.	Disaster preparedness and transparency are improved.
Population and economic growth drive demand to unsustainable levels, contributing to a vicious cycle of deteriorating water quality, marginal livelihoods, and fragility.	More efficient water use is encouraged by a pricing mechanism, and marginalized groups are provided with social safety nets.
Irresponsible politicians leverage water scarcity to mobilize nationalist or sectarian sentiments, perhaps in combination with support for violent separatists in Kashmir or Baluchistan.	Indo-Pakistani interdependence is strengthened by increased trade, awareness campaigns on water interdependence, and joint research on the predicted effects of climate change, thus decreasing the incentives for divisive politics. Institutional mechanisms on water cooperation are reinforced to prevent water from being used as a political pawn.
India insists on building new dams that Pakistan considers unacceptable.	Both countries refrain from unilateral measures and continue to use established conflict resolution mechanisms.

2.7 Sea-level rise and coastal degradation

Rising sea levels will threaten the viability of low-lying areas even before they are submerged, leading to social disruption, displacement, and migration; at the same time, disagreements over maritime boundaries and ocean resources may increase.

Rising sea levels already threaten the economic and physical viability of low-lying areas. Current estimates of sea-level rise suggest that no country will be entirely submerged during this century. However, as land and coastal resources are gradually lost, the economic and agricultural viability of many coastal areas will significantly decrease; damage from cyclones and storm surges will become more severe; and the risk of future land loss will become more pressing. These changes will push people to migrate and increase the risk of tensions and conflict in the receiving areas. As seas rise, changing coastlines may also alter border demarcations and trigger disputes over maritime boundaries, territorial seas, sea lanes, and ocean resources.

SEA-LEVEL RISE AND COASTAL DEGRADATION	
What is the risk?	Rising seas, storm surges, and increased salinization of coastal areas will decrease economic and agricultural viability, leading to increased fragility and migration. Rising seas will also submerge markers of sovereignty and economic exclusivity zones, which may lead to disputes and conflicts between states. Areas threatened with submergence will experience social and psychological disruption, migration, and fragility.
Tipping points	• Major storms or coastal disasters hit densely populated coastal centres. • Large numbers of people migrate inland from low-lying coastal areas. • Large-scale storm surges hit small-island states.
Entry points	• Support governments of countries with threatened low-lying areas in their efforts to take immediate adaptive action. • Support long-term efforts to plan and manage large-scale migration. • Provide diplomatic support for the United Nations Convention on the Law of the Sea and other multilateral efforts to resolve sea border disputes.

Sea-level rise threatens low-lying territories

It is virtually certain that the global mean sea level will continue to rise during this century, primarily driven by melting glaciers and thermal ocean expansion. By 2050, the rise is estimated to range from 0.15 to 0.3 metres above the mean for 1986–2005 (*IPCC 2013*). Barring an unforeseen abrupt shift, sea-level changes take place over the span of decades, leading to a slow creep of erosion, submergence, flooding, loss of coastal wetlands, and increased salinization of coastal soil and aquifers. Regional variations and storm surges will bring more uncertainty and intermittency to the rates of erosion, salinization, and submergence (*Hijioka et al. 2014*).

Abandoning land to the sea may be viewed as a necessary adaptation or as a sign of failure. For some countries, such as the Netherlands or the United Kingdom, physical and ecological protection mechanisms can hold the sea at bay and avoid the need to abandon land to the sea (*Butzengeiger and Horstmann 2004*). In poor rural areas, major investments in protection systems are less likely, leading to lost homes and farms and reducing both food security and economic opportunity, often without compensation. In larger states that have both high and low-lying areas, internal migration may help. For low-lying islands in the Pacific Ocean, no viable protection mechanisms may exist and states without any areas of higher elevation, such as the Maldives, may be threatened with complete inundation some time beyond this century (*Dasgupta et al. 2014*).

Countries with weak economies, high levels of poverty, and histories of conflict will particularly struggle to manage changes to their territory. A country such as the Solomon Islands, while not threatened with submergence, may be less able to manage change than other islands that score better on social and economic vulnerability issues (*Permanent Mission of Solomon Islands to the United Nations 2009*).

Rising seas will threaten many coastal cities, which will continue to grow rapidly

Cities built on river deltas are particularly susceptible to flooding and storm surges that can damage homes, businesses, and critical infrastructure. Rapid subsidence due to the over-pumping of groundwater will compound this challenge. The consequences for economic development could be significant, either through direct damage or the money needed to build protection systems. Investment in advanced protection systems is more likely to make economic sense for cities, which have more valuable assets to protect than rural areas. High-risk cities include Mumbai, Guangzhou, Rangoon, Guayaquil, Ho Chi Minh City, Kolkata, Manila, Jakarta, and Karachi (*Brecht et al. 2012; Hallegatte et al. 2013*).

Territorial threats will lead to forced migration

As lands threatened by rising seas become less viable, increasing numbers of people will be forced to migrate. This climate-induced migration may increase competition for resources in the receiving location, leading to tensions between migrants and established populations, and increasing the likelihood of conflict between groups (*Werz and Conley 2012*). Migration across borders can spur political and military responses related to border control, access to services, citizenship rights, and land rights. Cross-border migration may be especially challenging in regions where formal rules for citizenship and land ownership are not universally accepted or applied (*Wamugi and Muchemi 2011*). In Côte d'Ivoire, for example, the citizenship claims and land rights of long-established immigrants were significant factors in recent conflicts (*Human Rights Watch 2013*). Although these immigrants were not primarily driven by environmental factors, the countries they left are among those least able to handle climate change impacts.

Changing territorial boundaries might lead to conflict over maritime boundaries and exclusive economic zones

As seas rise, the changing coastlines and submerging territorial markers may trigger disagreement over maritime boundaries and exclusive economic zones, leading some low-lying island chains to lose control over wide swaths of sea (*UNFCCC 2005*). It could also lead to disagreement between states over sea lanes and control over ocean resources (*Paskal 2007*).

The United Nations Convention on the Law of the Sea (UNCLOS), which defines the limits to national territorial waters (12 miles) and exclusive economic zones (200 miles), is silent on the issue of changing coastlines. There is no universal agreement on whether maritime limits and boundaries should be permanently fixed or shift as coasts change (*Lisztwan 2012*). UNCLOS contains options for dispute

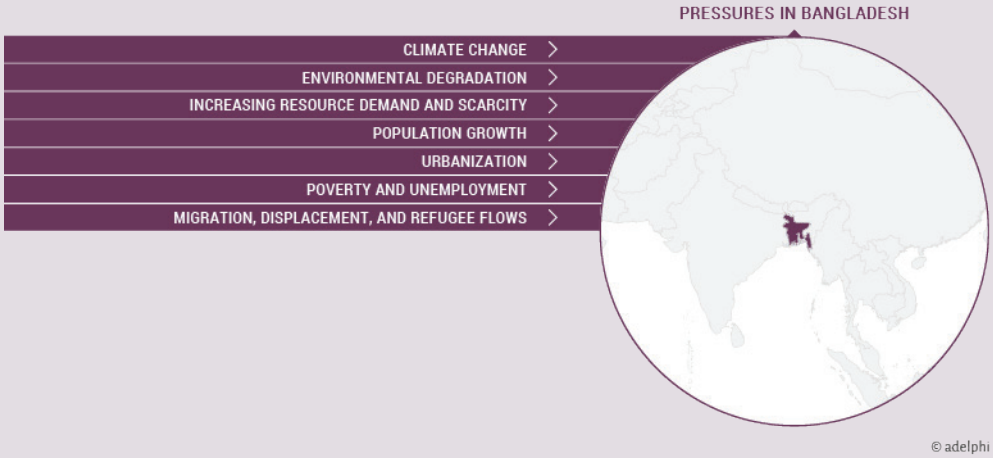
settlement for treaty members, including reference to the International Tribunal for the Law of the Sea (created by UNCLOS), the International Court of Justice, and special arbitration tribunals. Not all coastal states are UNCLOS members, however, and for those that are members, the success of its dispute settlement systems is not certain, even for those areas where the convention is clear. For example, in 2014, India and Bangladesh accepted an arbitration ruling under UNCLOS that delineated their maritime boundary in the Sea of Bengal, but China rejected UNCLOS arbitration for resolving a maritime dispute with the Philippines, expressing preference for a bilateral resolution (*Permanent Court of Arbitration 2014*; *Sevastopulo and Landingin 2014*).

There is a very low possibility of conflict between states that have agreed to a maritime border that then changes, as their track record indicates a desire to pursue a negotiated solution. But there may be a higher possibility of conflict for those situations where the borders have never been agreed. With the slow rate of sea-level rise, the number of locations where climate-induced coastline changes will significantly affect maritime boundaries by 2050 is likely to be very low and mostly predictable (*Di Leva and Morita 2008*).

Bangladesh
Coastal degradation and migration

While migration in Bangladesh is not new, more people are migrating from coastal areas to urban centres as their coastal farms and fishing areas become less secure due to coastal change, natural hazard-induced disasters, and increasing competition from a still-booming rural population. The Global Climate Risk Index cited Bangladesh as the sixth-most affected country by weather-related events such as storms, floods, and heat waves from 1994 to 2013 (*Kreft et al. 2014*). Sixty percent of the country is less than 5 metres above sea level, where it is extremely vulnerable to storm surges, erosion, salinization of soils and aquifers, and even complete inundation. The problem of soil salinity has been exacerbated by years of shrimp farming that have rendered land unfit for cultivation. Between 64,000 and 100,000 Bangladeshis are rendered homeless every year due to riverbank erosion (*Sharma and Hugo 2009*).

Up to 2,000 people enter Dhaka each day, especially during the monsoon period, which exacerbates the ecological pressures in this high-density city, which has about 28,000 people per square kilometre (*Hanif and Hossian 2010, cited by Saha 2011*). The migrants are often employed in marginal jobs and face appalling working and living conditions. As the numbers of migrants steadily increase, the weak urban infrastructure will face severe strains, including increasing numbers of squatter settlements and slums along with increasing pressure on services such as the provision of water, electricity, sanitation, and policing (*Mitra and Vivekananda 2013*).



Kiribati
A nation under threat

All but one of Kiribati's 33 islands are low-lying coral atolls. Because of saltwater intrusion, fresh water and agriculture are already under stress. Half the population lives on Tarawa, the capital island, which has struggled with unemployment, crime, and social unrest (*Weir and Virani 2010*). Continued sea-level rise will worsen these issues as increasing numbers of people move to the capital, which itself will be threatened in the very long term.

CLIMATE-FRAGILITY RISKS	
Will increase if . . .	**Will decrease if . . .**
The growing population in the capital is unable to find employment or housing, fuelling criminal activities and increasing social tensions.	Stronger social security schemes support the increased number of urban poor. The impact of migration is considered when designing policy responses to climate change.
Weak infrastructure is unable to cope with recurrent climate-induced disasters, spurring frustrations and reinforcing grievances against the government.	Infrastructure in vulnerable coastal areas is fortified and made more resilient.
Poverty and vulnerability increase due to limited livelihood options.	Investment in new economic activities creates jobs and improves local livelihoods.
The affected communities perceive unequal access to foreign aid, increasing grievances and tensions.	Conflict-sensitive targeting of humanitarian aid and development cooperation helps reduce, rather than increase, local tensions.

The Spratly Islands
Disputed territory

Ownership of the Spratly Islands — more than 100 low islands, reefs, shoals, and submerged banks in the South China Sea — is disputed by China, Vietnam, Malaysia, the Philippines, Brunei, and Taiwan (*Joyner 1999*). The Spratly Islands have a total land area of less than 5 square kilometres, none of it more than 4 metres above sea level. Rising sea levels may eventually submerge many of these landforms permanently. Dozens of the islands have been occupied by various military forces, and tension over competing claims has occasionally led to limited military skirmishes (*Lally 2010*). China has recently stepped up its efforts to expand existing landforms and build new ones, using material dredged from the sea floor, further complicating the geography of the disputes (*Hardy and O'Connor 2014*). China rejected UNCLOS arbitration for resolving a maritime dispute with the Philippines, preferring a bilateral resolution. Efforts to resolve ownership claims will be affected by climate change as rocks and atolls disappear, while others are transformed into different landforms.

CLIMATE-FRAGILITY RISKS	
Will increase if . . .	**Will decrease if . . .**
Coastal erosion and submergence advances quickly, altering maritime boundaries.	Sea-level rises and coastal changes are slow to arrive, allowing more time to adapt and build climate resilience.
China's leaders take confrontational, nationalistic steps to define its sea borders and modify the structure of the islands.	China joins international efforts to resolve local border disputes.
ASEAN leaders pursue confrontational policies, potentially bringing external actors into the mix.	ASEAN leaders prioritize cooperative efforts to resolve local border disputes.
Individual countries unilaterally develop oil and gas resources.	Oil and gas development is placed on hold while border issues are resolved.

2.8 Unintended effects of climate policies

As climate adaptation and mitigation policies are more broadly implemented, the risks of unintended negative effects — particularly in fragile contexts — will also increase.

To reduce fragility and prevent conflict, we need effective climate change mitigation and adaptation policies. However, if these well-intentioned policies are designed and implemented without considering their possible unintended impacts, they could undermine economic development, contribute to political instability, and exacerbate human insecurity. As climate adaptation and mitigation policies are more broadly implemented around the world, the risks of these unintended negative effects — particularly in fragile contexts — will also increase. In fragile situations, the unintended consequences could include increased insecurity of land tenure, the marginalization of minority groups, increased environmental degradation and loss of biodiversity, and accelerated climate change. These unforeseen effects often arise due to a lack of cross-sectoral coordination and, in the case of fragile and conflict-affected situations, a lack of conflict-sensitive implementation of policies and programs.

UNINTENDED EFFECTS OF CLIMATE POLICIES	
What is the risk?	Climate adaptation and mitigation policies can have unintended negative effects that increase livelihood insecurity, resource conflicts, and food price volatility. These unintended effects could increase fragility risks, if climate policies are not carefully designed to take into account their broader impacts and the possibility of contributing to conflict in certain settings.
Tipping points	• Large-scale financing for adaptation policies and projects does not include robust conflict assessments. • Global large-scale shift towards green technologies and renewable energy sources do not take steps to minimize the impacts of mining, manufacturing, and operations or increase resource efficiency. • Geoengineering technologies are implemented on a large scale.
Entry points	• Design conflict-sensitive adaptation strategies. • Assess all policies related to climate change for the risk of contributing to fragility. • Ensure transparent and accountable climate financing. • Foster multilateral stakeholder involvement in policy development (NGOs, community leaders, tribal councils, etc.). • Ensure community consultation and prior informed consent in adaptation and mitigation projects.

Forest management through REDD+ initiatives requires conflict-sensitive implementation to avoid negative impacts

Nearly 20 percent of global emissions are created by deforestation and forest degradation. The Reducing Emissions from Deforestation and Forest Degradation (REDD) programme was created by the UNFCCC to financially reward governments, companies, and forest owners in developing countries for protecting their forests. The REDD+ programme added efforts to increase conservation, improve the sustainable management of forests, and enhance forest carbon stocks. In principle, REDD+ could have potentially stabilizing effects in fragile or conflict-prone contexts (*Tänzler and Ries 2012*). In addition to contributing to economic development by generating new sources of revenue for often-marginalized social groups, REDD+ can also foster cooperation, dialogue, and confidence building at different levels. Using REDD+ as a vehicle for land tenure reforms that provide legal titles to local communities could also help reduce the types of conflicts that often arise when land tenure is unclear (*Cotula and Mayers 2009*).

But REDD+ involves complex governance and management structures that, if not implemented in a conflict-sensitive way, can have negative impacts (*Tänzler and Ries 2012*). For example, a pilot project in three watersheds in Nepal in 2009 and 2012 worsened livelihood insecurity and the potential for land conflict. The traditional livelihoods of the Chepang ethnic community included moving to new farmlands and harvesting forest resources, which were banned or restricted under REDD+ (*Uprety et al. 2011*). In addition, the alternative livelihood options that were provided were not suitable for all groups. For example, the community forest users of Jamuna were given money to buy pigs. However, due to the high costs of pig rearing, most of the community opted out, leaving only wealthy households to profit from the opportunity (*Patel et al. 2013*).

Local communities may be marginalized if REDD+ initiatives are badly designed or poorly implemented. The distribution of financial benefits or forest resources may create tensions and conflict, as seen in the Nepal case, where caste culture and local elites influenced the design of REDD+ initiatives. Benefits were distributed unequally, and some minority groups were excluded from the decision-making processes (*Patel et al. 2013*).

The likely increase of the value of forests could offer incentives to governments and powerful private-sector actors to seize control of woodlands, denying or ignoring the rights of forest-dwelling communities, especially those without formal land titles. REDD+ could also increase corruption and rent-seeking behaviour, although the international community has been trying to address this problem by establishing 'REDD Safeguards' (*Standing 2012*).

Substantial increases in the use of crop-based biofuels have already produced negative effects

Sixty-two countries have set targets for switching to biofuels from fossil fuels, leading global bioethanol production to triple between 2000 and 2007. Biodiesel production increased tenfold within the same period (*Gao et al. 2011*). These first-generation biofuels are mainly made from sugar, starch, or vegetable oil, which in turn are produced from corn, sugarcane, soybeans, and palm oil.

By increasing the demand for these food crops, the switch to biofuels helped increase food prices anywhere from 3 to 30 percent during the 2008 and 2010 food price crises (*Gasparatos et al. 2013*). Looking into the future, Fischer and colleagues (*2009*) estimate that by 2020, global biofuel expansion might increase the price of cereals by 8 to 34 percent, of other crops by 9 to 27 percent, and of livestock by 1 to 6 percent, putting an additional 131 million people at risk of hunger.

Biofuels have driven the conversion of rainforest, peat lands, savannahs, and grasslands to agricultural land, especially in Brazil, Southeast Asia, and the United States (*Fargione et al. 2008*), and have led to increased GHG emissions, atmospheric pollution, water overconsumption and pollution, deforestation, and biodiversity loss (*Gasparatos et al. 2013*). Today, up to 5.9 percent of deforestation in the

Brazilian region of Matto Grosso is due to soybean plantations for biodiesels (*Gao et al. 2011*). In the Amazon, the growth in other cash crops for biofuel production has averaged 7 percent annually since 2000 (*German et al. 2011; Valdes 2011*). Indonesia, one of the world's largest palm oil exporters, increased its plantation size from 4.2 million hectares in 2000 to 7.6 million hectares in 2009 (*Gao et al. 2011*).

The expansion of cash crops has created and contributed to local resource conflicts, mainly over land tenure. Examples include 'the displacement of poor families in Mozambique and Tanzania, the concentration of land to powerful actors in Brazil, Indonesia, and Papua New Guinea, the loss of land rights through coercion and lack of information in Indonesia, and even aggressive land seizures in Colombia' (*Gasparatos et al. 2013*).

Green technologies and renewable energies will increase extractive industry development, potentially spurring conflict over resource rents

The growing investment in green technologies and renewable energy sources is increasing the demand for certain minerals and metals, ranging from exotic materials, such as rare earth minerals, to mass metals, such as copper and steel. A large shift towards green technologies will increase demand and raise prices, thus driving more resource extraction. The social and environmental impacts of irresponsible resource extraction can lead to livelihood insecurity and local resource conflicts (*Bonds and Downey 2012*). Improving recycling and identifying substitute materials, together with increased resource efficiency, may counter this trend. Resource substitution alone, however, will simply shift increasing demand from one resource to another.

The Democratic Republic of the Congo's (DRC) mining boom in the 1990s and 2000s demonstrated the conflict potential of these dynamics. The rents from tin, coltan, gold, and wolframite undermined state institutions, increased corruption, and fuelled conflict by providing financing to armed groups (*Dabelko et al. 2013*). Natural resources and their rents can be an important source of revenue and employment and contribute to development. However, if poorly managed, the negative impacts of resource rents can lock developing countries into a vicious cycle of corruption, underdevelopment, and fragility, especially as extraction increases in fragile situations (*Stevens et al. 2013*).

A large-scale shift towards green technologies and renewable energy could reduce fossil fuel consumption significantly. How would countries that depend on fossil fuel exports as one of the main pillars of their economy manage this transition? There is little research on the economic, social, and political implications of a decrease in global oil consumption for oil-exporting states; 'what is known is that periodic oil price collapses since the first oil crisis of the 1970s have resulted in temporary hardship for the populations of many oil-exporting states' (*Dabelko et al. 2013, 23*).

Poorly designed adaptation polices can increase the vulnerability of certain groups, sectors, and systems to climate and fragility

Adaptation policies seek to decrease the vulnerability of states and societies to climate change. However, if not designed and implemented well, these policies can increase the vulnerability of certain groups, sectors, or systems (*Barnett and O'Neill 2010*). Their wider social, economic, environmental, and political impacts can increase the risks of local resource conflicts, livelihood insecurity, food insecurity, and vulnerability to disasters.

While there is no automatic link between adaptation and these unintended effects, they can arise if policies or measures are not context-specific and conflict-sensitive, or if they do not fully account for their impact on other sectors.

Geoengineering interventions are unproven and risky, and only address symptoms, not the problem

As the climate negotiations move slowly while the impacts of climate change grow, the possibility of engineering the climate by using large-scale interventions — known as 'geoengineering' — has garnered renewed attention. Ideas include removing GHGs from the atmosphere through large-scale tree planting; combining biomass for energy production and carbon capture and storage (BECCS); and fertilizing the oceans to grow phytoplankton (*Ginzky et al. 2011*). Other proposals include cooling the Earth directly by reflecting sunlight back to space or by increasing the transmission of terrestrial radiation to space (*Schaefer et al., forthcoming*).

The potential risks associated with these technologies are very different in scale and nature (*Ginzky et al. 2011*). Importantly, the only technique that is predicted to have a greater than 50 percent chance of keeping the global mean temperature increase under 2 °C is the widespread, industrial-scale use of BECCS (*Schaefer et al., forthcoming*). Such an effort would have large social, economic, and environmental impacts if agricultural land were to be used for growing biomass (*UNEP and Convention on Biological Diversity 2012*).

Stratospheric aerosol injection attempts to recreate the effects of a large-scale volcanic eruption to rapidly cool down the climate (*Rasch et al. 2008*). Proponents of this technology point out that it might be relative cost-effective and rapid, while critics point out that the risks associated with such a large-scale intervention in the climate system have not been sufficiently researched. For example, stratospheric aerosol injection might lead to changing regional precipitation patterns in Asia and Africa that would have a significant negative impact on livelihood and food security (*Schaefer et al., forthcoming; Dabelko et al. 2013*).

A general problem with climate engineering is that it only addresses symptoms and not the root cause of the problem (*Kiehl* 2008). In the worst case, critics fear that the hope of being able to engineer the climate will stall action on mitigation and adaptation, thus increasing risks if these technologies fail to deliver or stop working (*Dabelko et al. 2013*). With little to no formal international law or even informal norms governing the deployment of geoengineering, there is also considerable concern that militaries may be called upon to deploy or interdict geoengineering technologies.

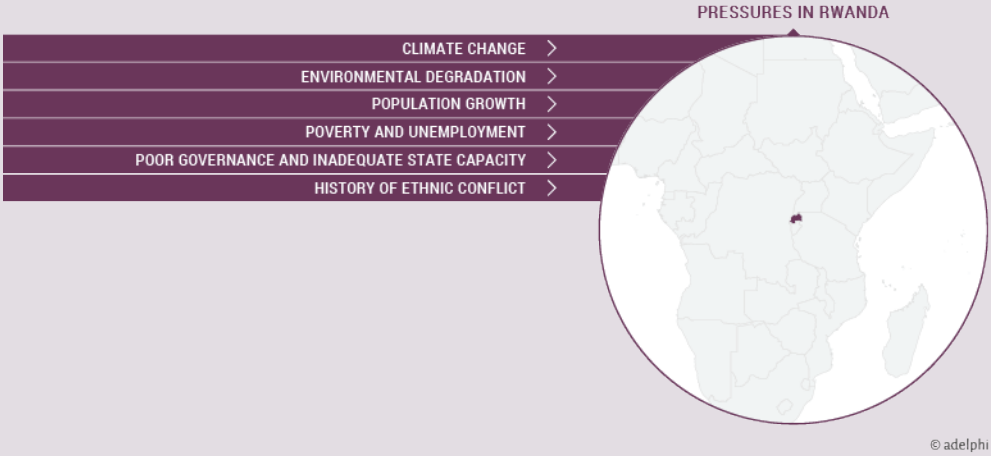
Rwanda

Disaster risk management increases fragility

Due to its mountainous topography, high population density, and changing climatic patterns, Rwanda's Ngororero District faces environmental risks. In 2007, flooding and landslides damaged houses and property, displacing thousands and destroying livelihoods (*UNDP 2012b*). The Rwandan government's land reform programme classified most of Ngororero as a 'high-risk zone'; people in these zones, who were predominantly rural poor subsistence farmers, were resettled to safer areas or imidugudus (model villages). Under the government's plan, the reclaimed high-risk land will be rehabilitated to reduce landslide risks by planting cash crops, such as tea and coffee, as a means to control soil erosion (*Ngabitsinze et al. 2011*).

However, the relocation of people has not been managed well and the displaced population lacks land to grow their own food. Energy security is also limited, as 98.8 percent of the district's households rely on firewood as primary fuel used for cooking (*Government of Rwanda 2013*). Given that the region has historically been afflicted by ethnic conflict, the risk is high that these strategies could exacerbate fragility.

Secondly, government strategies to shift production from market gardens and subsistence crops, such as potatoes and beans, towards cash crops, such as coffee and tea, increased vulnerability to climate change and, ultimately, fragility. Cash crops can reduce poverty and boost economic growth. However, tea and coffee are climate-sensitive crops, and terrace farming encourages deforestation. Moreover, the banning of subsistence farming increased grievances among people who were less able feed themselves (*International Alert, forthcoming*).



Global alliance
Climate-smart agriculture and the private sector

In 2014, the Global Alliance on Climate-Smart Agriculture (CSA) was launched at the UN Climate Summit with the goal of developing 'the technical, policy and investment conditions to achieve sustainable agricultural development for food security under climate change' (*FAO 2014a*). Based on the three pillars of sustainable agriculture, adaptation, and mitigation, this concept has been applied in farming, fishing, and pastoralist sectors in some of the most climate-sensitive areas in the world, including Africa, the Andes, and East Asia. Success stories have ranged from improving grazing pastures and sustainability practices in Qinghai Province of China to transboundary agro-ecosystem management in the Kagera River basin.

The alliance brings together governments and the private sector—including large companies such as Syngenta, Yara, Walmart, and McDonald's—which alarmed some civil society groups. NGOs feared that such an alliance would be used by companies to greenwash their activities while not changing their practices. The NGOs were especially critical of the complete lack of social and environmental criteria that would, for example, exclude the conversion of forests to agricultural land. In addition, they criticized the use of carbon offset funding for climate-smart projects, because it could create another driver of to take land from smallholder farmers, particularly in the Global South. It would also unfairly place the burden of mitigation on those who are most vulnerable but have contributed the least, to the climate crisis (*Climate Smart Agriculture Concerns 2014*).

CLIMATE-FRAGILITY RISKS	
Will increase if . . .	**Will decrease if . . .**
A social and environmental framework is not adopted. Social and environmental standards are too weak; implementation and monitoring are ineffective.	Social and environmental criteria are established as part of an international multi-stakeholder process. Monitoring bodies ensure that social and environmental criteria are met. Requirements to gain CSA status are legally binding.
Climate-smart agriculture (CSA) projects are conducted in farming, fishing, or pastoralist hubs where conflict over resources or fragility already exists, exacerbating competition and marginalizing certain user groups.	CSA projects are designed and implemented in a conflict- and climate-sensitive way, improving cooperation between competing user groups and fostering inclusive resource governance.
CSA projects promote large-scale agriculture, driving land dispossession in areas with ambiguous tenure rights and favouring large-scale farmers over small subsistence farmers. The companies involved in the CSA Alliance use the projects to increase farmers' dependence on their products, leading to debts and lawsuits over patented CSA technologies.	Special precautions for large-scale land acquisitions prevent livelihood insecurity and 'land grabs'. Social and environmental certification requirements and minimum standards prevent companies from using the CSA label when they violate land rights or increase livelihood insecurity.
Prioritizing climate-resilient cash crops over climate-sensitive food crops leads to a reduction in ready-to-eat food, decreasing food security in local communities.	The supply of food crops and cash crops is balanced to meet demand in local communities.

Global impacts of Arctic melting

As the Arctic melts, local livelihood insecurity and the radical acceleration of global climate change are higher risks than international conflicts over access to Arctic resources.

GLOBAL IMPACTS OF ARCTIC MELTING	
Entry points	• Strengthen existing Arctic governance institutions, in particular those providing a forum for resolving boundary and access disputes while strengthening environmental protections and monitoring. • Consult with native peoples living in the Arctic on how to balance extraction with sustainable and resilient local livelihoods. • Build partnerships to design and implement policy measures, such as low carbon and green growth strategies to reduce climate change pressures on the Arctic.

Climate change will increase the range of human activities in the Arctic. As the Arctic's sea-ice and permafrost disappear, new shipping lanes, trade passages, and areas for resource exploration are opening up. However, high levels of conflict in the Arctic over unresolved borders, control of Arctic maritime routes, and access to natural resources are currently unlikely, due to the strength of political institutions and the inhospitable environment. If Arctic resources are extracted on a large scale, the environmental and social impacts are likely to increase the livelihood insecurity of local populations. The melting of Arctic sea-ice and permafrost, including subsea permafrost beneath the East Siberian Sea, could substantially accelerate the pace of climate change and thus potentially increase all the compound risks discussed in this report.

The situation in the Arctic today

Warming in the Arctic is occurring twice as fast as the rest of the planet (*Huebert et al. 2012*). Since the 1970s, Arctic sea-ice has decreased by 12 percent per decade (*NASA 2013*). Arctic surface ice grows in winter and shrinks in summer, but the number of days per summer during which ice retreats far offshore has rapidly increased. As a consequence, between 1979 and 2010, Arctic sea-ice declined by almost 50 percent during the summer minimum and about 12 percent during the winter maximum (*Huebert et al. 2012; Fetterer et al. 2012*).

The melting of Arctic sea-ice, as well as new technologies, is making the Arctic region increasingly accessible. This includes opening new trade and shipping routes, such as the Northwest Passage, and new possibilities for resource exploitation, tourism, and fisheries (*IPCC 2014*).

The Arctic has an enormous potential for resource extraction

According to a report by the International Institute for Strategic Studies (*2011*), 20 percent of the world's hydrocarbon supply is located under the rapidly melting ice caps. This includes 30 percent of the world's unexplored gas and 13 percent of its unexplored oil reserves (*US Geological Survey 2008*). Exploration and extraction will require expensive, tailored technologies and will entail high risks (*Lee et al. 2012*).

The Arctic is also endowed with large deposits of minerals and metals. Arctic Russia produces 40 percent of global palladium supply and more than 10 percent of global nickel and cobalt (*Lindholt 2007*). Greenland has deposits of gold, niobium, platinum group metals, tantalum, fluoride, zinc, and rare earths, all of which are largely undeveloped (*Boersma and Foley 2014*). In 2013, Greenland ended its ban on mining radioactive materials and is now exploring extracting and exporting uranium (*EurActiv 2014*).

Increased activity could bring new conflict risks if geopolitical conflicts overwhelm Arctic governance mechanisms

As the strategic importance of the Arctic increases, some see the potential for increased conflict (*Käpylä and Mikkola 2013; CNA 2014*). However, the inhospitable environment and the strength and performance of political institutions leads others to view these conflict scenarios as unlikely.

To date, the regional and international governance structures have been successful in managing diverging interests, and the Arctic states have demonstrated little appetite for escalating tensions into conflict (*Huebert et al. 2012*). The Arctic Council, the main forum for Arctic governance, was founded in 1996 by Canada, Finland, Denmark, Iceland, Norway, Russia, Sweden, and the United States. In 2008, five of the Arctic states signed the Ilulissat Declaration to agree on protecting the marine environment, maritime safety, and emergency responsibilities for possible new shipping routes. In 2011, the Arctic Council's member states signed their first agreement on air and maritime cooperation. In 2013, all the Arctic states renewed their commitment to settle their maritime border disputes peacefully through the UNCLOS treaty (*Käpylä and Mikkola 2013*).

The social and environmental impacts of large-scale resource extraction could create local fragility risks

The government of Greenland is seeking more economic independence by developing its energy and extractive sectors, especially since fish stocks off the coast of Greenland are depleted due to overfishing and climate change (*FAO 2010*; *Rüttinger and Wolters 2014*). In 2013, Greenland awarded the first oil and gas exploration and exploitation licenses and announced it will invest €8.4 billion in the energy sector by 2020 and €1.2 billion in mining (*Rüttinger and Wolters 2014*; *Casey 2014*). However, recent decreases in commodity prices have led to a slowdown of exploration in the Arctic (*Holter 2015*; *Tully 2015*).

The environmental and social impacts of mining in Greenland are largely unknown. Arctic ecosystems are highly sensitive and will become more vulnerable as climate change impacts become more pronounced. Water and soil contaminated by mining would have a negative impact on the livelihoods of local indigenous communities. If resource extraction is not managed well, increased livelihood insecurity and negative environmental and social impacts could create new conflicts between mining companies and local populations (*Rüttinger and Wolters 2014*).

Melting could radically destabilize the climate, accelerating climate-fragility risks globally

Even without the expansion of human activity in the Arctic, the rapid melting of the Arctic ice sheet and permafrost could radically destabilize the climate. The IPCC discusses three 'large-scale singular events', or tipping points, in the Arctic that, if reached, might lead to abrupt and drastic changes that would have a very large, global impact. Modelling these thresholds is difficult, and the projections often carry a high degree of uncertainty (*IPCC 2014*). The risk of crossing these critical thresholds in the Arctic might significantly increase all other compound risks globally.

First, as light-reflecting ice decreases, an increasing amount of solar radiation is absorbed by the surface, accelerating melting and warming (*UNEP 2012b*). The excess heat that is absorbed by the Arctic Ocean in summer is later released into the atmosphere, where it contributes to increasing atmospheric temperatures (*Francis and Vavrus 2012*). A 2014 assessment projects a nearly ice-free Arctic summer by the 2030s (*Melillo et al. 2014*). Arctic amplification feedbacks are likely to continue during the next decades and result in large changes in surface air temperature by 2100 (*Overland et al. 2013*).

Second, major shrinking of the Greenland ice sheets would significantly and irreversibly exacerbate global sea-level rise. The melting of Greenland's ice sheets has already produced an annual increase in sea levels of 0.5 millimetres over the past 20 years. In a 4°C scenario, it is estimated to contribute to the projected sea-level rise of 0.52 to 0.98 metres by 2100 (*Fettweis et al. 2013*; *IPCC 2014*).

Third, thawing permafrost may release large amounts of methane, a GHG that is 25 times more potent than carbon dioxide and a powerful driver of climate change. By 2100, permafrost surface area is expected to decrease by 37 percent in a world that is 2°C warmer, and by up to 81 percent in a 4°C world (*IPCC 2013*). In 2012, a Nature study estimated that between 2015 and 2025, 50 gigatons of methane may be released from thawing permafrost beneath the East Siberian Sea, increasing the current level of methane in the atmosphere by 10 times, which would create a feedback loop that would result in US$60 trillion in damage (*Whiteman et al. 2013*). Permafrost is expected to start thawing within the next few years and to continue for centuries, with impacts in both the short term (until 2100) and long term (after 2100) (*UNEP 2012b*).

2.9 Conclusions

The seven compound risks discussed in this chapter lead us to some clear conclusions.

The risk analysis of local resource conflicts underlines the importance of sound management institutions. These institutions must be able to manage the increasing pressures of population growth, economic development, environmental degradation, and climate change. However, if these institutions feed into conflict drivers, such as inequality and the marginalization of certain groups, they can entrench and exacerbate fragility.

Livelihood insecurity is closely linked to employment, income, and migration. When climate change affects livelihoods that are dependent upon climate-sensitive sectors, such as agriculture, the risk of political instability increases—especially in countries with large youth populations and low legitimacy. The movement of people from rural areas to cities and across borders is an important transmission belt for risks, especially if pressures in the receiving regions rise to unsustainable levels, as we have seen in the Middle East during the Syrian and Islamic State conflicts. However, the movement of people is also one of the most important safety valves for coping with livelihood insecurity.

The relationship between extreme weather events, disasters, and fragility is often mutually reinforcing: Disasters exacerbate existing vulnerability, and if states fail at disaster preparedness and management, legitimacy suffers and grievances increase. However, if they manage disasters well, the crisis can instead provide an opportunity to improve the relationship between society and the state—and in some cases, even build peace between former enemies.

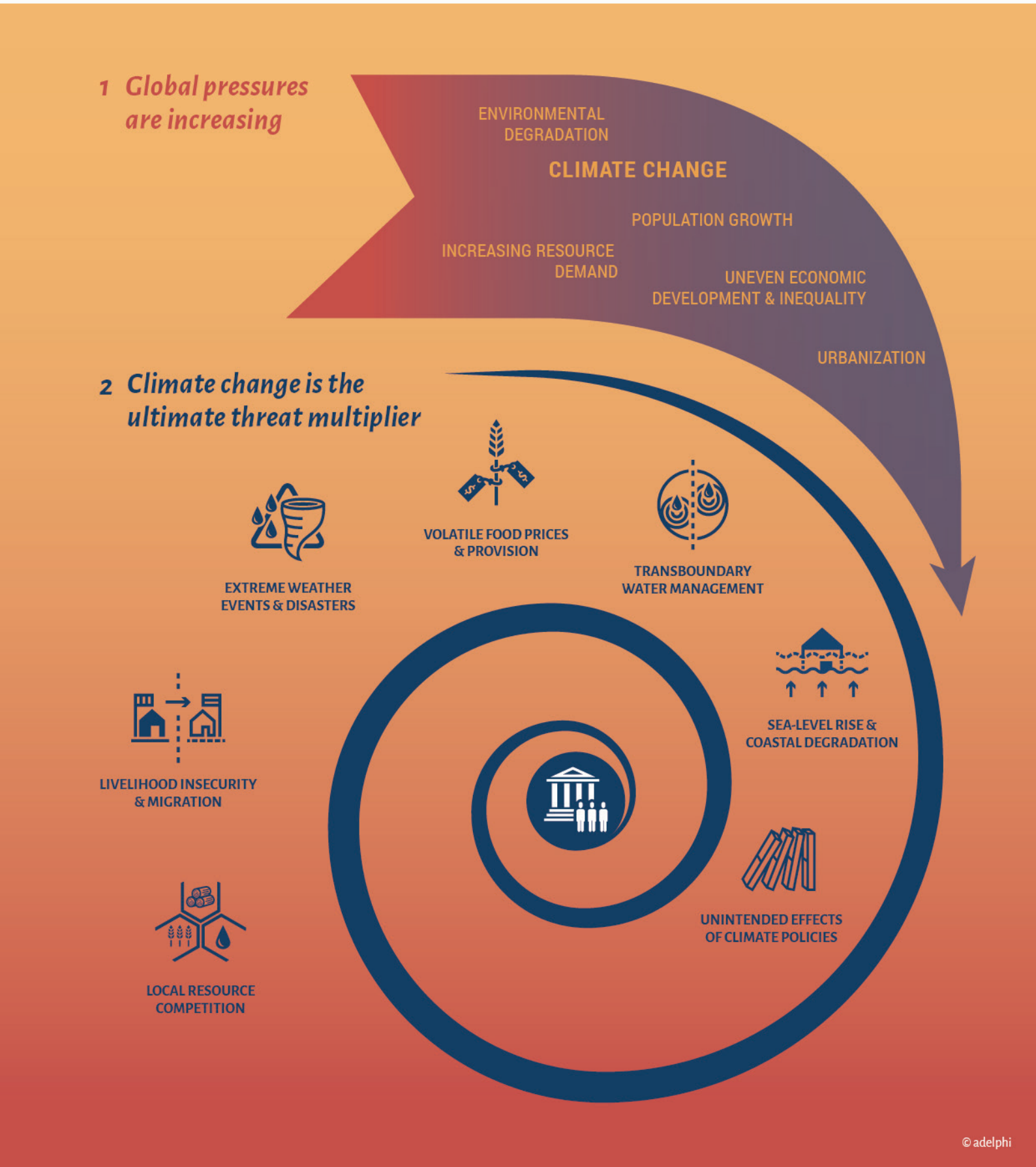
Volatile food prices and provision can be a major driver of fragility. When food prices change quickly and unexpectedly, regimes that rely on food subsidies as a substitute for a real social contract can face political instability and unrest. In a world of increasing demand, the volatility of prices and supply is expected to be exacerbated by climate change. Due to the global nature of food markets and supply chains, shocks can easily travel around the globe. If countries take unilateral actions to secure their own supply by introducing export bans, the risks increase for everybody.

Demand and supply pressures on water resources will increasingly converge with climate change. However, the risk of transboundary water conflicts is not driven by scarcity but by the particular river basin's political and institutional context. If transboundary water management institutions are not able to manage increasing pressures, states may feel compelled to politicize conflicts over water use. Plans for new large-scale water infrastructure can fundamentally change water management regimes and alter the balance of power in a basin, potentially provoking pre-emptive conflicts.

Rising sea levels are an existential threat to many countries around the world. The loss of territorial integrity will change borders and might contribute to conflicts over contested boundaries. While rising sea levels will not lead to total or significant submergence until 2050, the impacts that precede submergence are just as worrisome; disasters such as storm surges and saltwater intrusion will increase livelihood insecurity and lead to migration long before submergence.

The Arctic will suffer more from the impacts of climate change than the rest of the world. As ice and permafrost retreat, the possibility of human activity increases. The risk of conflict over unresolved border issues, the control of maritime routes, and access to natural resources depends on the level of geopolitical tensions. However, the knock-on effects created by the environmental impacts of resource extraction in the Arctic could drive local fragility. In addition, the melting of the Arctic ice sheet and permafrost is a tipping point in the Earth's system that could substantially accelerate climate change and thus increase all compound risks in other parts of the world.

Seven compound climate-fragility risks threaten states and societies



© adelphi

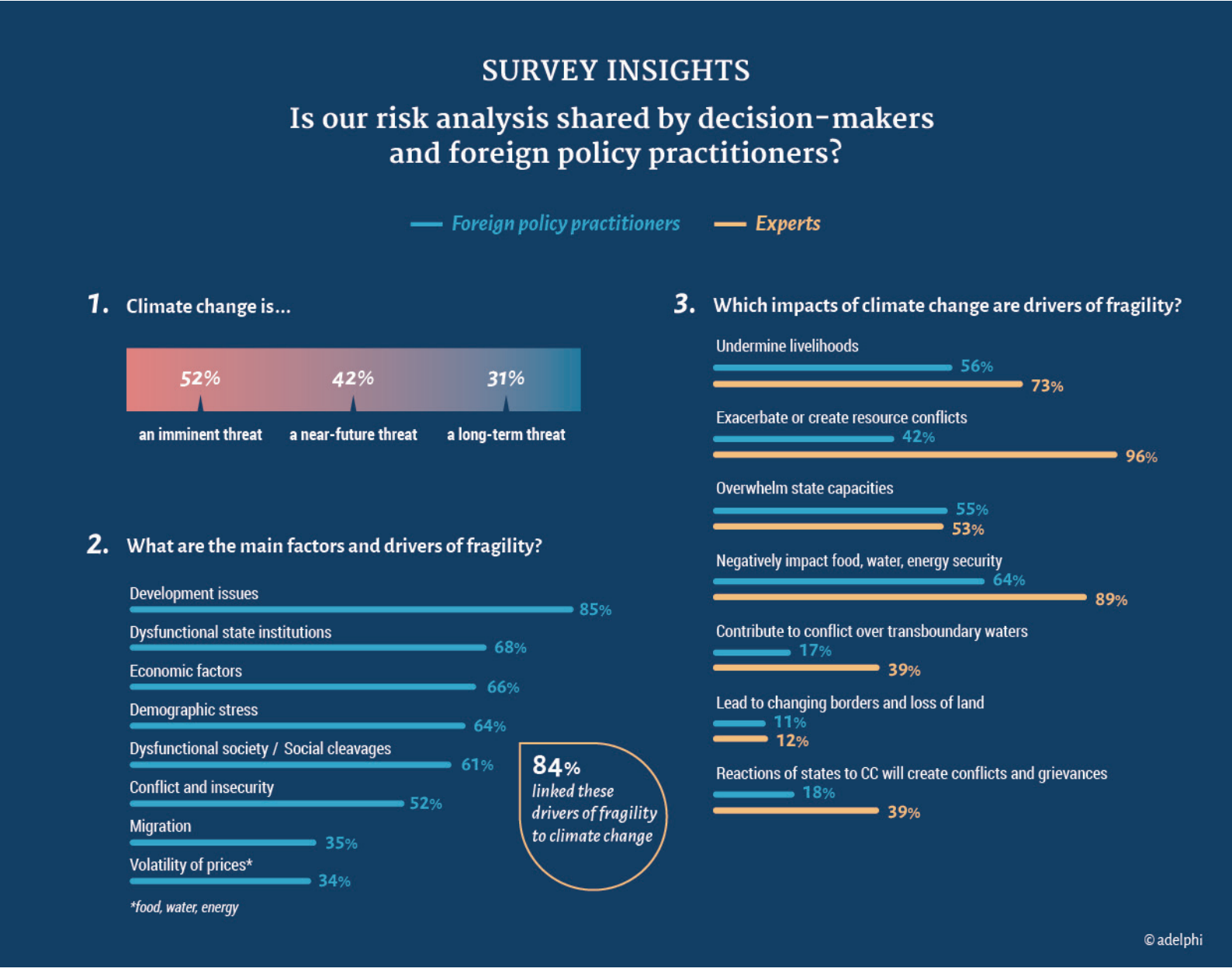
We are already living in a world of increasing pressures on states, societies, and the environment. The drivers and pressures—as outlined in the introduction and illustrated throughout the risk analysis—are largely the same across the different compound risks. A majority of the risks are closely linked to food, water, and energy security and the natural resources and ecosystems on which they rely. Accordingly, they are not isolated from each other and are affected by the same drivers and pressures: climate change, increasing population and demand, mismanagement, and environmental pollution and degradation. The compound risks mainly differ in how these pressures interact.

There are significant differences in the situations of fragility that these risks can create. Some risks are more prone to push a state farther towards fragility and, in extreme cases, into conflict. The risks interact in multiple ways. For example, local natural resource conflicts and livelihood insecurity operate mainly at the local level but can have significant, larger knock-on effects, such as migration. In places where these compound risks cross a threshold, they can destabilize whole countries and regions. On the other hand, transboundary water conflicts often have large impacts that threaten livelihoods and access to natural resources at the local level. Global markets and extreme weather events around the globe have an impact on global supply chains, driving political instability.

In general, it is clear that certain regions and countries are at risk, and these compound risks will increase. The climate change and the other pressures outlined in this report will increase significantly in the next 20 to 30 years. However, it is not clear how and if states, societies, and regions will be able to manage these pressures and risks. We can at least identify certain climate and fragility risk profiles, as exemplified in the case studies and scenarios.

It is important to understand that climate change is increasing the complexity of global challenges and fragility at the same time. If strategies fail to take into account the interdependent and systemic nature of these risks, they will fail or, in the worst case, exacerbate the risks they try to address. For example, mitigation and adaptation policies are necessary and important to avoid fragility and conflict. However, if designed and implemented without considering their broader impacts, climate policies themselves can drive risks by exacerbating livelihood insecurity, local resource competition, volatile food prices and provision, and transboundary water management.

Foreign policy must rise to the challenge of the different climate and fragility risks outlined here and foster strategies and approaches that cross sectors. Interdependent challenges need integrated answers. Systemic risks need smart and iterative policies that allow for learning and adaptation, not one-size-fits-all solutions. On the positive side, strategies and policies can address multiple risks and problems at the same time. The next chapter looks at the policies, institutions, and processes that are already in place and how they can be used to build resilience against these compound climate and fragility risks.



Survey:
Is our risk analysis shared by decision-makers and foreign policy practitioners?

A survey of 102 G7 foreign policy practitioners, which was conducted as part of this project, found that 52 percent consider climate change an imminent threat and 42 percent view it as a near-future threat. While survey respondents identified a wide variety of factors and drivers of fragility, the majority cited development issues (85 percent), dysfunctional state institutions (68 percent), demographic stress (64 percent) and economic factors (66 percent). Only a minority identified volatile energy, food, and water prices (34 percent) and migration (35 percent). A wide majority (84 percent) linked these drivers of fragility to climate change.

This infographic compares the survey responses from foreign policy practitioners to those from a group of 29 national climate and security experts also surveyed as part of this project. The risk perception differs regarding the role of resource conflicts; food, water, and energy security; and transboundary waters. Only a minority of both groups saw changing borders and loss of land as a risk. Arctic melting was not part of the questionnaire and is thus not featured in this table.

Since 2005, the World Economic Forum has surveyed experts and global decision-makers annually on the greatest risks facing the world. Over the last decade, the resulting Global Risks Report has recorded a shift away from economic risks in general and towards environmental risks, including climate change, extreme weather, and water scarcity. While this survey treats climate change as an environmental risk rather than a broader social, economic and geopolitical risk, it shows a significant increase in the importance of environmental risks. In addition, the 2015 report of the World Economic Forum underlines the importance of rising socio-economic inequality and structural unemployment, noting that the effects of climate change will further increase the pressure on societies (*World Economic Forum 2015*).

3 Policy Analysis: An Integrated Agenda for Resilience

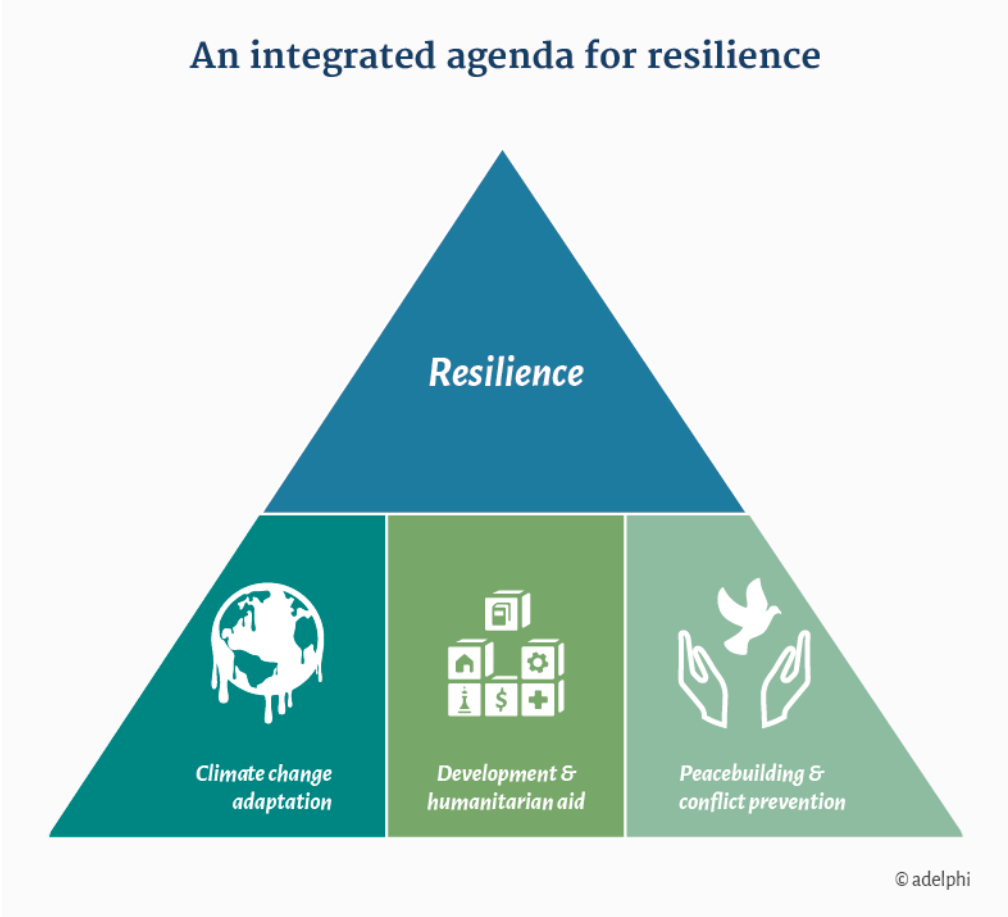
How do we address the compound risks posed by the effects of climate change? How can policymakers prevent these risks from spurring fragility? What are the key policy processes, instruments, tools, and approaches that can be used to mitigate these climate-fragility risks and build resilience to them?

In this chapter, we examine existing policies and tools and identify priorities for developing a proposed policy agenda for resilience to climate and fragility. We find that integrating climate, development and humanitarian aid, and peacebuilding efforts is key to effectively addressing climate-fragility risks—not only because the risks are interconnected but also because such an approach could help achieve resilience as an overarching objective of the three areas. This integration is likely to yield significant co-benefits even when the goals and tools are different.

The key institutions in these three policy areas are currently formulating and implementing a new agenda for resilience, including the Organisation for Economic Co-operation and Development (OECD), the International Federation of the Red Cross, the g7+ initiative, and the G7 governments, such as the United Kingdom and the United States (*International Dialogue on Peacebuilding and Statebuilding 2011; USAID 2012a; OECD 2014b; IFRC 2012*). These organizations all may have different areas of focus—such as climate protection, conflict prevention, or economic stability—but their definitions of resilience do not significantly differ. They all assume that resilient states and societies can absorb shocks and transform and channel radical change or challenges through the political process, while maintaining political or social stability and preventing violence. To this end, they support strengthening different types of capacities, such as:

- absorptive capacity, which includes coping mechanisms during periods of shocks (e.g., early harvest against food insecurity)
- adaptive capacity, or the ability of a system to adjust, modify, or change itself to mitigate future dangers (e.g., introducing drought-resistant seeds)
- transformative capacity, or the ability to create a fundamentally new system that is not susceptible to climate change impacts (e.g., conflict resolution mechanisms).

However, a number of obstacles, which we identify in this chapter, prevent the focus on resilience from producing better development and humanitarian programming on the ground. Given the many different entry points and stakeholders involved, a systematic and holistic approach to climate-fragility resilience requires leadership to generate momentum and establish a clear direction, which will be discussed further in Chapter 4.



Managing climate-fragility risks requires an integrated approach

Foreign policymakers can approach climate change and fragility risks from three main angles: climate change policy, international development cooperation, and peacebuilding:

FIRST, CLIMATE CHANGE ADAPTATION helps countries anticipate the adverse effects of climate change and take action to prevent, minimize, and respond to its potential impacts. Improving the capacity for climate adaptation in fragile situations is key. Many countries face significant barriers to assessing their adaptation needs and acquiring the tools for adaptation, which impedes efforts to improve adaptation capacity. The international climate change process (UNFCCC and partners) seeks to address these gaps by establishing an international adaptation architecture and emphasizing the need to integrate adaptation into development planning.

SECOND, DEVELOPMENT AND HUMANITARIAN AID programmes help states and populations build their economic, governance, and social capacities and improve their resilience to shocks. Global processes—such as the post-2015 development agenda, the Sustainable Development Goals, and the Sendai Framework for disaster risk reduction (as a follow-up to the Hyogo process)—seek to increase both national ownership of development and the resilience of societies against sudden shocks and slow-onset disasters.

THIRD, PEACEBUILDING AND CONFLICT PREVENTION PROGRAMMES in fragile contexts address the causes and effects of conflict by reducing tensions and creating an environment conducive to sustainable peace. In addition, natural resource management and livelihood security are elements of a much broader approach, as is being pursued by the dialogue on the New Deal for Engagement in Fragile States and the g7+ initiative (see the box below). Although climate change is not yet a high priority for the New Deal dialogue, the initiative is remarkable because it is the first forum for political dialogue to bring together conflict-affected and fragile countries, international partners, and civil society.

The New Deal for Engagement in Fragile States and the g7+

The NEW DEAL FOR ENGAGEMENT IN FRAGILE STATES, a key agreement between fragile states and partners that seeks to change the policy and practice of engagement, was endorsed in November 2011 at the Fourth High-Level Forum on Aid Effectiveness. It was called for by the g7+ and developed through the International Dialogue on Peacebuilding and Statebuilding.

The g7+ is a voluntary association of 20 countries that are or have been affected by conflict and are now in transition to the next stage of development. The main objective of the g7+ countries is to share experiences and learn from one another, and to advocate for reforming the way development partners engage in conflict-affected states.

The INTERNATIONAL DIALOGUE ON PEACEBUILDING AND STATEBUILDING is the first forum for political dialogue to bring together conflict-affected and fragile countries, international partners, and civil society in order to catalyse successful transitions from conflict and fragility. The dialogue seeks to drive political momentum for change through strong partnerships, innovation, and mutual accountability for results. It gives fragile states a voice and promotes solutions based on country ownership and a comprehensive approach to development and security issues.

The most sustainable way to reduce the chances that climate change will increase fragility is to mitigate climate change. However, to address the compound risks identified in this report, measures to support adaptation are just as important. The IPCC, among others, identified potential adaptation options to manage these risks in the Working Group II chapter on human security (*IPCC 2014*). In addition, the UN has called for addressing climate adaptation in the context of global security (*UN Secretary-General 2009*). But how can we best design adaptation policies to build peace and resilience?

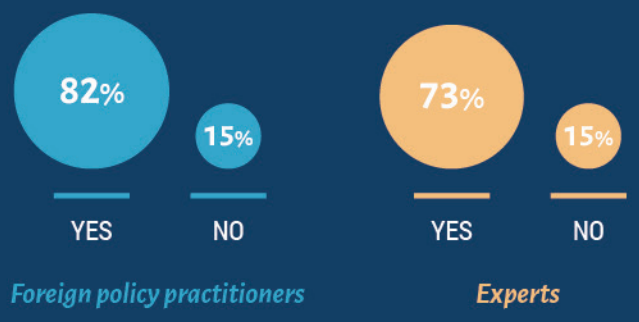
As discussed in the previous chapter, single-sector interventions are not enough to prevent future climate change impacts from increasing fragility. While we do need specific policies to address risks like water scarcity or food shortages, climate policy alone will not reduce fragility risks. In addition, the pursuit of integration can result in significant co-benefits among policy fields and goals. For instance, experts have shown that efforts to adapt to climate change can contribute to building peace by improving cooperation, equity, and fairness (*Bob and Bronkhorst 2014; Tänzler et al. 2013a*).

The calls to recognize the interconnections between the objectives of climate change adaptation, development, and peacebuilding are increasing (*UNEP 2009; Peters and Vivekananda 2014; UN WCDRR 2015*). Stressing the compound nature of the risks, the significant overlap between adaptation and development agendas, and the potential co-benefits and synergies, this report calls for adopting an integrated approach.

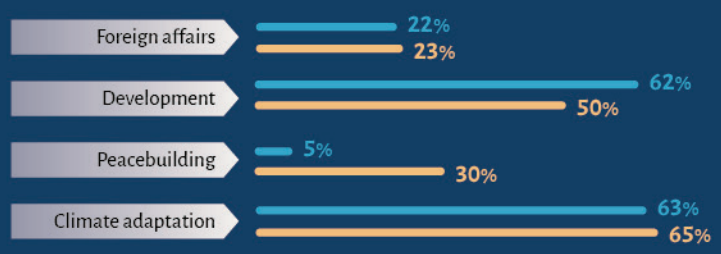
SURVEY INSIGHTS
Existing initiatives and policies

— *Foreign policy practitioners* — *Experts*

4. Are there any initiatives or policies that address the risks of climate change and fragility in your host country?



5. Which policy field do they belong to?



Our survey of G7 foreign policy practitioners and experts located in countries with situations of fragility identified the following noteworthy trends:

1.

Both groups, G7 foreign policy practitioners and experts, think that the risks of climate change and fragility are already being addressed through initiatives and policies.

2.

Both groups report that the initiatives are better aligned with the tools of the development or climate change adaptation sectors than with the foreign policy or peacebuilding sectors.

3.

A larger percentage of the experts consider these initiatives to be part of the peacebuilding sector than the foreign policy practitioners (30 percent vs. 5 percent).

© adelphi

There are four critical stages where integration is necessary:

1. EARLY WARNING AND ASSESSMENT: We can use the existing knowledge on climate change more effectively in fragile situations by making it more accessible to decision-makers. Integrating knowledge from across adaptation, development, and peace-building sectors and making such analysis available to decision-makers is arguably the most important step. Due to the existing gaps in assessment, most foreign and security policy deliberations on adaptation take place in separate political arenas, with minimal exchange between the respective fields.

2. STRATEGY AND PLANNING: We need to integrate conflict prevention and climate change adaptation into development programme plans. Similarly, we need to integrate violence prevention and conflict sensitivity measures into climate change adaptation plans. An integrated approach embeds climate change adaptation, development, and peacebuilding in the design and objectives of interventions and strategies.

3. FINANCING: We need to balance the serious needs in fragile situations with the capacity to absorb financing. Climate financing should prioritize integrated and cross-sectoral projects that also address development and peacebuilding objectives. In addition, we must adhere to the principles of aid effectiveness, harmonize aid, and ensure accountable and transparent spending, especially in countries with situations of fragility.

4. IMPLEMENTATION: We need more guidelines on how to breach sectoral silos in implementation. For example, monitoring and evaluation of climate and development programmes need to measure the peacebuilding benefits of these programmes. Particularly in fragile situations, adaptation efforts must be implemented in a conflict-sensitive way by applying the do-no-harm principle.

3.1 Climate change adaptation

INTEGRATING FRAGILITY INTO CLIMATE CHANGE ADAPTATION POLICIES	
Stage	**Climate change adaptation policies**
Early warning and assessment	Climate vulnerability assessments often lack a fragility lens and a transboundary perspective, even though the climate change elements of the compound risks are already apparent in states experiencing situations of fragility.
Strategy and planning	Adaptation planning must move beyond a technical understanding to a more comprehensive notion of resilience. The ongoing planning processes could be leveraged to increase national and regional planning capacity and improve adaptation plans at both levels.
Financing	Climate finance is expected to increase substantially in the coming years, but it is not clear that states in fragile situations will be able to benefit from initiatives such as the Green Climate Fund.
Implementation	Since adaptation efforts will impact people's livelihoods, asset base, and power dynamics, interventions need to distribute benefits and resources in a conflict-sensitive way that does not aggravate tensions between communities. However, there is limited guidance on how to do this effectively.

3.1.1 Early warning and assessment

Efforts to adapt to climate change require scientific expertise, political know-how, the appropriate tools, and public support. However, not all countries have this capacity. The international community is seeking to improve the availability of data on climate change-related trends through country reports to the UNFCCC and vulnerability assessments to inform the national adaptation plan (NAP) process. The UNFCCC's guidance for countries is a meaningful resource, especially for least developed countries (LDCs), thanks to the work of institutions like the Adaptation Committee or programmes like the Nairobi Work Programme on Impacts, Vulnerability, and Adaptation to Climate Change (see the infographic on the next page).

NATIONAL COMMUNICATIONS TO THE UNFCCC: The regularly published reports that countries prepare for the UNFCCC include information on GHG emissions and the activities undertaken to implement the convention. These reports usually also contain information on national circumstances, such as vulnerability assessments, available financial resources, and technology transfer.

An analysis of the national communications from countries to the UNFCCC indicates that the sections on vulnerability and adaptation assessment have initially been quite general and need to be more relevant to policymakers, in part because the guidelines given to the countries were non-binding (*Luboyera 2003*). In addition, the reports include little discussion of the political or social impacts of climate change trends. Nor do they include information on the country's conflict history or its marginalized groups (*Tänzler et al. 2010*).

Nepal's reports, however, offer an instructive exception. After identifying its most vulnerable populations in its 2004 Initial National Communication to the UNFCCC and 2008 National Capacity Self-Assessment, Nepal designed local-level adaptation programmes in the most climate-vulnerable districts of the mid- and far-western regions of Nepal (*Kissinger and Namgyel 2013*).

VULNERABILITY ASSESSMENTS: Vulnerability assessments identify climate change hotspots and provide input for adaptation and development planning at all levels (*Fritzsche et al. 2014*). Numerous guidelines and handbooks provide best practices for analysing vulnerability. However, only recently have efforts focused on standardizing assessment approaches to provide a sound basis for policies at all levels. Vulnerability assessments should cover a broad range of sectors and topics (e.g., water, agriculture, fisheries, and ecosystems) as well as different spatial levels and time horizons. The NAP process, as the main planning process under the UNFCCC (see below), should also include an assessment of climate change vulnerabilities at different levels.

These vulnerability assessments do not include the role and drivers of fragility; nor do they address transnational or transboundary issues (*LDC Expert Group 2012*). They typically exclude the broader social impacts of climate change as well as links to fragility and conflict (*Fritzsche et al. 2014*). Conflict analysis should be integrated as much as possible into these assessments, including climate hazard assessments, livelihood resources assessments, vulnerability matrices, and community-based adaptation plans.

3.1.2 Strategy and planning

A climate-resilient community is more capable of coping with changes in governance, capacity, regime, or other internal and external shocks and peacefully settling conflicts (*OECD 2008a*; *IFPRI 2013*). As long as the fragile or conflict-affected situation persists, a country's ability to deal with environmental hazards is greatly compromised. However, while the international climate change regime provides extensive support and guidance for adaptation frameworks in developing countries, there is no specific guidance for adaptation planning in fragile situations.

Adaptation strategies in countries experiencing situations of fragility must be linked to long-term strategies of peacebuilding and development in order to simultaneously address the different compound risks. In addition, climate change adaptation planning must go beyond technical and financial understanding to a more comprehensive notion of resilience that also considers the importance of human and institutional capacities. One of the biggest barriers to effective adaptation planning and action is a lack of coordination, including a lack of inter-ministerial coordination in the affected countries (*Lehmann et al. 2012*). Roles and responsibilities may be not clear if, for example, climate adaptation is under the remit of the Ministry of the Environment, the Ministry of Civil Defence is in charge of disaster risk reduction, yet another ministry is responsible for conflict and fragility-related issues, and the overall planning process is on the agenda of the Ministry for Planning.

NATIONAL ADAPTATION PROGRAMMES OF ACTION (NAPAS): NAPAs address the most urgent adaptation needs of the LDCs, which in many cases are also experiencing situations of fragility. The Adaptation Committee defines NAPAs as 'action-oriented, country-driven, flexible and based on national circumstances' (*Adaptation Committee 2013,13*). They include input from grassroots communities to build upon existing coping strategies (*LDC Expert Group 2012*). Through the process of preparing and

implementing NAPAs, countries identify and rank the activivities and projects that respond to their most urgent and immediate needs in agriculture and food security, water resources, coastal zones, and early warning and disaster management.

As of 2014, 49 LDCs had completed and submitted their NAPAs to the UNFCCC secretariat, including almost all the 20 g7+ states, except Côte d'Ivoire, Papua New Guinea, and South Sudan. These 17 g7+ countries have listed water as one of their key adaptation priorities, followed by agriculture, human health, and forestry. Eight countries recognize that the impacts of climate change may cause conflict (over water shortages, soil degradation, natural resources, rising sea levels, and between pastoralists and farmers), with demographic change being an aggravating factor. An additional two countries identified ongoing conflict as a barrier to successful climate change adaptation (*UNFCCC 2014c*).

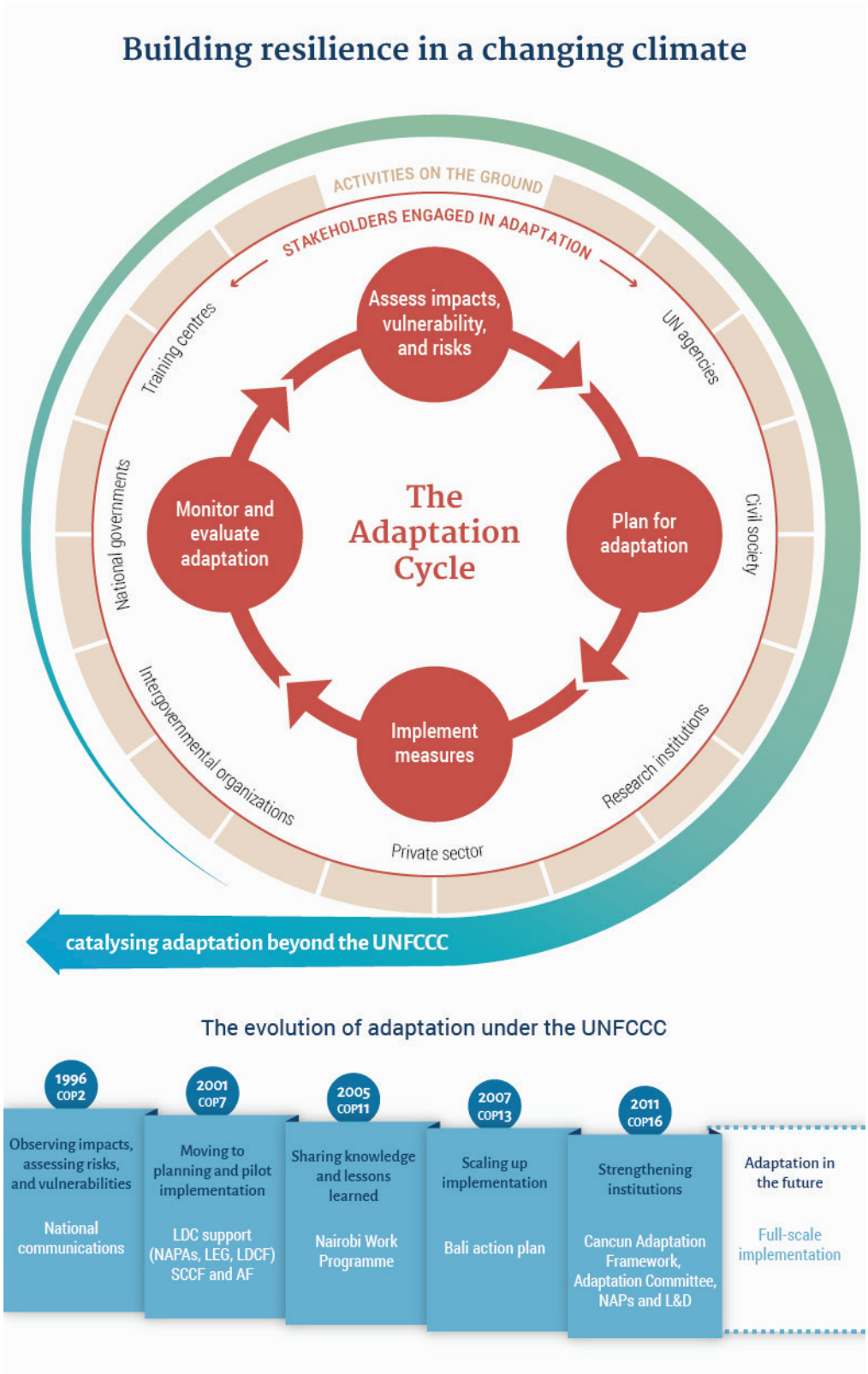
THE NATIONAL ADAPTATION PLAN PROCESS: Established in 2010 as part of the Cancun Adaptation Framework, the NAP process seeks to reduce the vulnerability of developing countries, especially the LDCs and the most vulnerable groups. The NAP process identifies medium- and long-term adaptation needs and strategies, including an assessment of potential co-benefits in other sectors. The guidelines also call for integrating adaptation into national and subnational development planning. Eight of the 20 g7+ countries currently receive financial and technical assistance from the NAP Global Support Programme through the Least Developed Countries Fund (LDCF), which may offer potential entry points for including climate-fragility risks because this process is ongoing (*UNDP-ALM 2014*).

A collection of best practices for adaptation planning recently published by the UNFCCC (*2014b*) sheds some light on promising approaches to tackling water scarcity, food insecurity, and human mobility. For example, the International Organization for Migration (IOM), together with the Nansen Initiative on Disaster-Induced Cross Border Displacement and other institutions, provided an overview of tools and methods for adaptation planning processes that address human settlements. IOM is working closely with its member states to include human mobility issues in adaptation planning. This ongoing discussion within the UNFCCC process can also be used to provide more guidance for the specific adaptation planning challenges faced by countries experiencing situations of fragility.

There has been less guidance on and fewer opportunities to address the transboundary dimension of climate change impacts, such as transboundary river basins (*Pohl et al. 2014*; *Tänzler et al. 2013b*). Adaptation programmes still lack a regional focus, as the state-oriented focus of the UNFCCC makes it challenging to develop regional adaptation policies (*Tänzler et al. 2013b*). However, a recent assessment by the Adaptation Committee on the role of the NAP process and institutional arrangements also identified the need to support national adaptation planning through regional organizations (*Adaptation Committee 2014*). In addition, in the UNFCCC's best practice collection on adaptation planning, the Global Water Partnership offered insights on developing regional cooperation in climate change adaptation in transboundary waters and shared aquifers for regional and economic development. As one of the key results, the Global Water Partnership stated that it helped nine regional organizations develop agreements, commitments, investment options, and tools that integrate water security and climate resilience (*UNFCCC 2014b*).

Stronger regional cooperation will help adaptation programmes tackle cross-boundary issues, especially in the case of transboundary water cooperation, which has not been adequately addressed by the international climate policy process. In addition to the UNFCCC-led process, there are other bilateral and multilateral initiatives that can also address the adaptation planning needs of countries.

LOSS AND DAMAGE: The debate on loss and damage is particularly relevant to the developing countries that are most vulnerable to the adverse effects of climate change. Some of these adverse effects, such as extreme weather events and slow-onset disasters, can cause loss and damage when the limits of adaptation are surpassed. Loss and damage have also been referred to as the 'residual'



› Adapted from UNFCCC (*2014a*)

impacts of climate change, which mitigation and adaptation could not prevent (*Okereke et al. 2014*). The relevant body within the UNFCCC process, the Executive Committee of the Warsaw International Mechanism, began by focusing on gathering appropriate data. The international debate over loss and damage is ongoing, and has spurred disputes over how adaptation and loss and damage should be addressed in a future climate change treaty. This dispute should not hide the fact that the risks of loss and damage are real and that net losses in these situations can be dramatic for some countries. As a result, a timely focus on addressing loss and damage in countries facing situations of fragility should complement processes of adaptation planning.

3.1.3 Financing

Donor contributions to climate finance are expected to increase substantially in the coming years. The international community has committed to providing US$100 billion annually starting in 2020, including financing for adaptation as a major area. These financial resources will come from a variety of public and private sources, both bilateral and multilateral. Innovative financing instruments should help to unlock bigger and better sources of climate finance. According to the Cancun Agreement (2010), a significant share of new multilateral funding for adaptation should flow through the Green Climate Fund (*UNFCCC 2011*).

The estimated need for adaptation finance has increased considerably: According to UNEP's 2014 'Adaptation Gap' report, the annual cost of adaptation in developing countries will likely require two to three times the annual amount of US$70–100 billion by 2050 previously estimated by the Fifth Assessment Report of the IPCC (*UNEP 2014c*). In Africa alone, the costs of adaptation over the next two decades are estimated to be US$20–35 billion per year (*AfDB 2011; UNDP 2014*). However, as also described in the Fifth Assessment Report, the wide range of estimates illustrates the difficulty of calculating the costs of adaptation (*IPCC 2014*).

Countries with situations of fragility receive proportionally less climate financing than other developing countries. The OECD has calculated that the states it defines as fragile received no more than 5 percent of the funding from other GEF-administered climate funds, excluding the LDCF (*OECD 2010*). Under the LDCF, however, all the g7+ countries with completed NAPAs have implemented at least one project (based on *UNFCCC 2014d*).

Access to the ADAPTATION FUND is more complex: First, due to the current extremely low prices on the carbon markets, the Adaptation Fund has very limited financial resources. In addition, accessing the funds has been challenging for many countries due to a lack of institutional capacity and fiduciary standards. This is especially true for the direct-access option, which is generally welcomed by developing countries as a way to strengthen their ownership. However, only two of the 20 g7+ states (the Solomon Islands and Papua New Guinea) have received funding from the Adaptation Fund (*2014*). Thus, less than 5 percent of the 41 Adaptation Fund projects are being implemented in the g7+ countries, and only 20 percent are in countries on the OECD's list of fragile states (*Adaptation Fund 2014*).

Among the newest instruments in the global climate finance architecture, the GREEN CLIMATE FUND (GCF) is designed to promote the shift to a low-emission and climate-resilient development pathway. The GCF is the key institution for ensuring accountable and transparent spending of the US$100 billion commitment mentioned above. While US$10.14 billion had been pledged by the end of 2014, the fund is still not fully operational and will not finance its first programmes and projects before the second half of 2015 (*Schalatek et al. 2014*). Though it is too early to assess the GCF, it does offer potential entry points for better addressing the specific needs of countries with situations of fragility. However, the complexity of its processes casts some doubts on how easily countries facing situations of fragility will be able to access the GCF.

UNFCCC AND KYOTO PROTOCOL FUNDS SUPPORTING ADAPTATION	
GEF Trust Fund	Supports vulnerability and adaptation assessments as part of the national communications to the UNFCCC
Least Developed Countries Fund (LDCF)	Supports the preparation and implementation of NAPAs and the NAP process
Special Climate Change Fund (SCCF)	Finances adaptation activities that increase resilience to climate change (including the NAP process)
The Adaptation Fund (not managed by GEF)	Funded by a 2 percent levy on proceeds from Clean Development Mechanism projects, as well as from other voluntary sources
Green Climate Fund (GCF)	Supports the mitigation and adaptation efforts of developing countries, particularly LDCs, small island developing states, and African countries

In addition to the financing mechanisms directly related to the UNFCCC, there are other initiatives that can be relevant for addressing climate-fragility risks.

GLOBAL CLIMATE CHANGE ALLIANCE (GCCA): Launched in 2007 to strengthen dialogue and cooperation on climate change between the European Union and developing countries, particularly LDCs and small island developing states, the GCCA provides both a platform for dialogue and technical and financial support for the most climate-vulnerable countries. Its five priority areas are adaptation, disaster risk reduction, REDD, mitigation, and mainstreaming climate change into development. It supports 51 programmes in 38 countries, with a steadily increasing budget that totalled €316 million in 2014 (*GCCA 2015b*). Furthermore, the GCCA strives to apply the aid effectiveness principles of the 2005 Paris Declaration by using budget support (22 percent of funding in 2014) and by supporting the harmonization principle through ongoing frameworks and processes (*GCCA 2015b*).

Nine of the 20 member states of the g7+ receive support from the GCCA. Almost all these projects are in the GCCA's priority areas of adaptation, mainstreaming, and disaster risk reduction. However, though the GCCA emphasises its efforts to enhance aid effectiveness and use national systems, only one member country of the g7+ (the Solomon Islands) receives general budget support for its Climate Assistance Programme, while all other initiatives are project-based (*GCCA 2015a*). In 2014, a new phase of the GCCA, the GCCA+ flagship initiative, began in line with the European Commission's new Multiannual Financial Framework (2014–20). In the field of adaptation, special attention will be directed to the question of migration, using the GCCA's two mutually reinforcing pillars, exchange of experience through dialogue and technical and financial support.

THE AFRICAN UNION'S AFRICAN RISK CAPACITY TO ESTABLISH THE EXTREME CLIMATE FACILITY (XCF): As an African-led initiative, the XCF—which is still in the conceptual stage—will facilitate direct access to private capital and leverage public funds for those African countries that are most vulnerable to climate change. It will use innovative finance mechanisms, such as risk pooling, to help states respond to the impacts of climate change. The multi-year payments from the XCF will be determined by climate data from the forthcoming Extreme Climate Index, which will measure the frequency and magnitude of extreme weather events. The bonds are to be financed by capital from private investors, with donors supporting the annual bond coupon payments. XCF will be structured to issue more than US$1 billion in African climate change bonds starting in 2016 for the following 30 years (*African Risk Capacity 2015*). Like the GCF, it is too early to assess the XCF, but it could also offer entry points for addressing the specific adaptation finance needs of countries with situations of fragility.

Sectoral Approaches: Food Security

The global architecture for improving climate change, agriculture, crisis response, and food security is fragmented with different planning, financing, and implementing programmes and policies spread across UN agencies (e.g., UNEP, WFP, IFAD, and FAO), the World Bank, and regional development banks. These institutions closely cooperate with national governments and with the international climate policy process.

The World Food Programme (WFP), for example, seeks to improve its analysis of climate impacts on food security so it can better design policies. As the second-largest multilateral implementing entity of the UNFCCC's Adaptation Fund, the goal of the WFP is to help build the climate resilience of the world's most food-insecure populations. Currently, the six WFP projects under the Adaptation Fund build resilience through analysis, programming, knowledge sharing, and capacity building at different levels (e.g., in Egypt, Ecuador, and Sri Lanka) (*WFP 2015*).

The FAO produces assessments, conducts planning (e.g., vulnerability assessment and planning in the Nile River basin), and implements projects (e.g., transboundary agro-ecosystem management project for the Kagera River Basin in Africa). The FAO-Adapt approach seeks to identify adaptation solutions not only in agriculture, but also in forestry and fisheries (*FAO 2013*).

In addition, global responses to the 2008–9 food crisis included the UN High-Level Taskforce on the Global Food Security Crisis and the Global Agriculture and Food Security Programme of the G8, which demonstrated a clear commitment to action as part of the G8's L'Aquila food security initiative. However, the programme was underfunded, which has made it difficult to ensure more consistent investments in agriculture and food security (*UNRIC 2009*).

At the same time, the G20 considered a broad range of risk management options for an integrated approach. For example, multilateral development banks could make advance purchases, develop countercyclical mechanisms, and offer weather or crop insurance.

On the advocacy and research side, the Institute for Agriculture and Trade Policy offered guidance on using strategic food reserves as a climate adaptation strategy after the food price crises of 2008–9 and 2011–12 and called for an internationally coordinated approach to food reserves (*Institute for Agriculture and Trade Policy 2012*).

These manifold activities, however, have not led to an integrated approach, such as a clear partnership structure that would allow affected national governments to maximize coherence and the efficient use of relevant financing mechanisms. On the implementation side, there is an opportunity to form coalitions for food security and to build climate resilience, especially in the states that are most vulnerable to climate shocks. To this end, the activities of the Committee on World Food Security (CFS) can offer some guidance. In 2012, the CFS adopted Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries, and Forests in the Context of National Food Security. In addition, the CFS in 2014 unanimously codified the Principles for Responsible Investments in Agriculture and Food Systems (known as the RAI Principles). The G7 has already committed to supporting these principles globally (*Commission on Sustainable Agriculture and Climate Change 2012*).

3.1.4 Implementation

The overall number of adaptation projects at the implementation stage is on the rise. However, there are fewer projects in countries experiencing situations of fragility, compared with other developing countries. For example, of the 50 projects under the SCCF, only 8 have been funded in countries on the OECD's list of fragile states (*OECD 2014a*). None of the g7+ members has been a host country. In this context, there has been little research on the implementation of adaptation measures in fragile situations.

Conflict-sensitive adaptation is based on the 'do no harm' principle, which establishes that development interventions should not exacerbate existing fragility and should instead increase resilience and build peace (*Tänzler et al. 2013b*). Because adaptation measures have a significant impact on people's livelihoods, asset base, and power dynamics, interventions need to distribute resources and benefits in ways that do not aggravate tensions between communities.

The overall lack of conflict-sensitive adaptation projects in fragile contexts is reflected in the lack of institutional expertise and guidance for such efforts. Pilot projects or programmes are rare, making it hard to build expertise and experience that can be used to develop guidance and training. So far, the potential for regional initiatives to support these processes has been widely neglected (*Tänzler et al. 2013b*).

CONFLICT-SENSITIVE LOCAL ADAPTATION IN NEPAL AND UGANDA: A Saferworld project in Nepal focused on increasing the conflict sensitivity of local adaptation programmes of action (LAPAs). Participatory workshops with representatives from community-based organizations and local authorities raised awareness of the links between climate change and conflict. However, some of the key stakeholders resisted applying a conflict-sensitive approach because it threatened to weaken their grip on resources. These challenges might be addressed by additional participatory and inclusive methods and by incorporating conflict sensitivity into the project's adaptation measures. If necessary, donors should support capacity building for local stakeholders throughout the implementation phase (*Saferworld 2011*).

In the Kasese and Arua districts of Uganda, Saferworld involved district-based civil society representatives and local authorities in the installation of water projects (i.e., a gravity flow scheme and water boreholes). The project also worked to resolve conflicts over land ownership and borehole maintenance. Moreover, the project sought to avoid triggering violence by increasing water flows, thereby improving the relationship between the local community and the district government. More feedback and more transparent service delivery also improved the relationship between beneficiaries and public servants (*CECORE et al. 2008*).

MONITORING AND EVALUATION (M&E) AS SUPPORT FOR CONFLICT SENSITIVITY: As part of the implementation of the NAP process, countries are asked to develop monitoring and evaluation plans. As the case of Cambodia illustrates, the importance of monitoring and evaluation is already being acknowledged, even outside the NAP process: Cambodia's Strategic Plan of Rural Development for Climate Change Adaptation calls for the development of a monitoring and evaluation system for the 10-year strategy (2013–22).

To address the lack of lessons learned and best practices, monitoring and evaluation must be a priority of implementation, not only to make sure that projects adjust to the ever-changing context but also to make sure that information and knowledge are fed back into planning and strategy development. Such systems can be expanded to cover the interaction with drivers of fragility. In addition, initiatives and programmes should develop strategies that help the participants handle conflict-related issues constructively after a project is over. Projects should build lasting capacities to continue analysing the conflict context and to sustain a conflict-sensitive approach (*Saferworld 2011*).

3.2 Development and humanitarian aid

INTEGRATING CLIMATE ADAPTATION AND FRAGILITY INTO DEVELOPMENT AND HUMANITARIAN AID POLICIES	
Stage	**Development and humanitarian aid policies**
Early warning and assessment	Processes like the Hyogo Framework have provided important lessons learned. However, progress has been limited due to financial constraints and a lack of human capacity and many early warning systems do not factor in climate or environmental risks.
Strategy and planning	We know how to 'climate-proof' development projects by mainstreaming climate into development programming. However, this approach is not yet standard, especially in fragile contexts.
Financing	Funding for countries with fragile situations and climate-sensitive development is at risk. A flexible, harmonized, and integrated aid structure with a longer-term perspective is needed—and it must consider some states' limited capacity to absorb funds.
Implementation	Implementers must engage local communities, institutions, and civil society to build local ownership. By working together with local officials and leaders who have the confidence of their constituencies, implementers can strengthen governments' effectiveness and accountability.

3.2.1 Early warning and assessment

Development and humanitarian aid programmes offer a number of efforts related to early warning that can contribute to the integrated assessment of climate-fragility risks, such as the Hyogo Framework and the INFORM initiative. However, progress has been limited due to financial constraints and a lack of human capacity. In addition, many early warning systems do not assess climate or environmental risks.

POST-HYOGO AND SENDAI FRAMEWORK: The 2005 World Conference on Disaster Reduction in Kobe, Hyogo, Japan, called for integrating a multi-hazard approach to disaster risk reduction into sustainable development, relief, rehabilitation, and recovery programmes. The results of this 10-year process were discussed at the Third World Conference on Disaster Risk Reduction in March 2015 in Sendai City, Japan, and are also part of the ongoing high-level debate on the post-2015 development agenda.

In its recently published progress report, UNISDR (*2014*) highlighted some best practices as well as major shortcomings on multi-risk assessment, monitoring systems, early warning systems, and transboundary risks management. It found that early warning systems are most effective when they combine science and technology to assess, monitor, and disseminate risk information to vulnerable segments of communities. These observations also found their way into the Sendai Framework (*UN WCDRR 2015*).

The limited progress reported by UNISDR is mostly due to financial constraints and limited human capacity, both at the national and regional levels. As part of the Hyogo Framework, countries were asked to establish a Multi-Hazard Early Warning System. Many countries cited the lack of such a system as a major constraint. In several cases, early warning systems for certain risks do not exist, while in other countries, early warning systems are poorly coordinated. Coordinating efforts within the public sector and engaging the media and telecommunications were also named as challenges. Accordingly, one priority of the newly adopted Sendai Framework is improving the understanding of disaster risks. The framework suggests a number of activities to this end at the national and global levels (*UN WCDRR 2015*).

INFORM (INDEX FOR RISK MANAGEMENT): One of the most comprehensive approaches, INFORM claims to be the first global, objective, and transparent tool for understanding the risk of humanitarian crises. INFORM brings together all relevant global organizations involved in crisis prevention, preparedness, and response to develop and use a shared risk assessment. An open-source platform, INFORM was developed in response to recommendations from numerous organizations to improve the common evidence base for risk analysis. It is a collaboration of the Inter-Agency Standing Committee Task Team on Preparedness and Resilience and the European Commission, supported by numerous UN organizations (UNEP, UNDP, UNICEF, UNISDR, OCHA, World Health Organization, WFP), the OECD, and UK Aid. The INFORM model measures three dimensions of risk: (1) hazards and exposure, (2) vulnerability, and (3) a lack of coping capacity. While the INFORM model may be a potential candidate for an overall integrated assessment approach, it does not consider climate change-related trends, aside from drought.

In addition to these global-level activities, a number of **bilateral early warning programs** demonstrate the importance of integrating different policy perspectives for an effective early warning approach.

The GERMAN MINISTRY FOR ECONOMIC COOPERATION AND DEVELOPMENT'S CRISIS EARLY WARNING SYSTEM assesses the conflict potential of all partner countries. If a country is at risk for conflict, peace and conflict assessments are mandatory, and peacebuilding needs are included in the country strategy and development programmes. However, since it is based on an assessment of the country's political economy, the early warning system rarely considers environmental or climate factors (*Rüttinger and Carius 2013*).

USAID'S CONFLICT ASSESSMENT FRAMEWORK 2.0 (*USAID 2012b*) includes climate change impacts as conflict dynamics to assess. The framework incorporates climate change as one of its diagnostic questions to ensure that its potential impacts on resource competition are covered by development programmes. The recently published CLIMATE CHANGE AND CONFLICT ANNEX to the USAID Climate-Resilient Development Framework provides further guidance on a basic climate-sensitive conflict analysis, which assesses how climate change might influence the development context, institutional performance, and key actors' interests, resources, and strategies (*USAID 2015*).

DFID TANZANIA'S MULTI-HAZARD DISASTER RISK ASSESSMENT, conducted in March 2014, assessed climate change-related trends, including the country's susceptibility to natural hazards, climate variability, and extreme weather. In addition, it incorporated rising tensions between political parties and religious groups, conflict over land, land invasions, and food insecurity into the risk profile. The resulting risk profile will guide DFID's preparedness and resilience work in Tanzania (*Peters and Vivekananda 2014*).

3.2.2 Strategy and planning

Climate adaptation programmes that are planned through national development processes are more likely to be mainstreamed, sustainable, and cost-effective. This is not only a priority for the NAP process, but also for meeting the principles of development effectiveness as agreed during the High Level Fora on Aid Effectiveness in Paris or Buzan. One of the key prerequisites for an integrated climate and development planning perspective is a robust governance structure at all levels, including institutional mechanisms that can help to improve coordination among the relevant ministries within countries. Adaptation measures must be tailored not only to the climate challenge but also to situations of fragility, which can 'undermine the foundations of resilience-protection-response' (*Smith and Vivekananda 2009*).

International support for integrated activities could potentially help countries avoid missing opportunities to coordinate climate adaptation and national development plans (*Kissinger and Namgyel*

2013). There are a number of examples where this is not the case. For example, Niger's Poverty Reduction Strategy for 2012–15 does not reference its NAPA or any other climate-related document, even though it cites the need to coordinate sectoral policies. Senegal's Second National Communication on Climate Change (2010) calls for a climate change-related strategy to be integrated into the national development strategy, but the country's National Strategy for Economic and Social Development for 2013–17 does not include climate change.

INTEGRATING ADAPTATION AND DEVELOPMENT PLANNING: There is already a rich landscape of approaches seeking to integrate the different agendas of adaptation and development; the OECD (*2009*), the German Development Cooperation (*GIZ 2010*), USAID (*2014a*), and UNDP and UNEP (*2011*) have issued guidance for 'climate-proofing' development projects by mainstreaming climate into development programming. In a nutshell, climate-proofing requires subjecting all policies to two questions: To what extent could the policy or programme be vulnerable to risks arising from climate variability or change? And to what extent could the programme increase vulnerability, leading to maladaptation? (*OECD 2009*; *UNDP-UNEP 2011*).

The OECD calls for integrating adaptation not only into local and sectoral policy frameworks but also into foreign policy to better manage shared resources, such as transboundary river basins. Applying a 'climate lens' to planning and regulatory frameworks can help identify particularly vulnerable sectors and geographical zones (*OECD 2009*).

GIZ's tool provides a systematic way to reduce climate risk as well as increase the potential for adaptive capacity. The tool is used to assess whether a development project's goals are threatened by climate change; to identify adaptation measures within the scope of the project; and to identify a climate-friendly way of achieving the project goals (*GIZ 2010*).

USAID's Climate-Resilient Development Framework calls for integrating climate considerations directly into development activities across multiple sectors (*USAID 2014a*). For example, the Planning for Resilience in East Africa through Policy, Adaptation, Research, and Economic Development (PREPARED) programme seeks to mainstream resilience to climate change into the development planning and implementation of the East African Community and its partner states (*USAID 2014a*). In addition, in September 2014 President Obama issued an Executive Order on Climate-Resilient International Development to strengthen the resilience of US international development programmes and investments by 'requiring agencies to factor climate-resilience considerations systematically into the US government's international development work and promote a similar approach with multilateral entities' (*White House 2014*). This effort includes sharing knowledge, data, tools, information, frameworks, and lessons learned in incorporating climate-resilience considerations.

The UK GOVERNMENT's 2011 Humanitarian Policy calls for integrating development, humanitarian aid, climate change, and conflict prevention (*DFID et al. 2011*). Humanitarian aid should follow the 'do no harm' principle to avoid unintended negative side effects. In addition, the policy establishes minimum standards for disaster resilience programming in the different partner countries, including developing a country/regional disaster resilience strategy (*DFID 2011a*).

The activities described above are also part of a larger trend of **designing new ways of programming and involving a larger number of partners** to take advantage of synergies.

THE EU JOINT PROGRAMMING APPROACH: With Joint Programming, the EU aims to enhance the efficiency and effectiveness of aid delivery by reducing fragmentation among its projects and programmes. In order to enhance country ownership, the European External Action Service and DG Development are currently preparing joint country strategies based on national development plans in 20 countries. The process starts by mapping the EU's and member states' priorities, planning cycles, and programmes. A needs analysis conducted with the partner country government is translated into a Single Country Strategy. To develop its full potential, Joint Programming needs to

Humanitarian disaster response: How to 'do no harm'

DO NO HARM

Inappropriate humanitarian disaster responses can inadvertently do more harm than good.

For example, while responding to the 2010 earthquake in Haiti, the UN peacekeeping forces failed to treat water sources for cholera. The outbreak caused the death of thousands of Haitians, prompting demonstrations, rioting, road blockades, and clashes between protestors and UN troops in Haiti. The Haitian police were called in to protect the UN troops, who were accused of spreading the water-borne disease.

Be climate sensitive

Failure to consider the links between disaster responses, environmental resources, and climate change can increase the risk of conflict by damaging the natural resource base that communities rely on. For example, the livelihoods of fishermen in eastern Sri Lanka were undermined after the Indian Ocean tsunami by the delivery of too many fishing boats, which led to overfishing.

Conflict responses must be 'disaster smart'

Disaster-blind conflict interventions, such as poorly planned resettlement programs, can reinforce disaster risks. In Sudan, the growth of internally displaced persons (IDP) camps increased pressure on limited resources. International humanitarian agencies cut down trees for timber to build the camps. The resulting deforestation led to loss of fertile topsoil and exacerbated water scarcity. The unsustainable use of timber and water increased the already fragile livelihoods of the millions affected by conflict.

Distribute aid equitably and avoid exacerbating inequalities

Humanitarian responses can exacerbate pre-existing inequalities or create new ones by unequally distributing aid.
In Pakistan, NGOs responding to the floods of July-August 2010 distributed aid unevenly due to a lack of coordination and a complex security situation. Even within the same village, relief packages differed widely, raising tensions both within the community and with the NGOs *(Street 2012)*. Following the 2010 Haiti earthquake, people living immediately outside of the relief camps objected to the disparity in services between the camps and neighbouring communities.

Don't assume responses are politically neutral in fragile situations

By assuming that humanitarian efforts are immune to political manipulation, aid workers may inadvertently cause harm, exacerbating grievances in places where state-citizen relations are already fragile.
Requiring humanitarian assistance to be channelled through the state can marginalize certain groups or factions of society that are in conflict with the government, as in post-tsunami Sri Lanka.

Sources: Alexander (2006); Street (2012); UNEP and OCHA (2014)

© adelphi

synchronize budget cycles, reporting, and other processes between donors and the partner country and to overcome the allocation preferences of individual member states (*European Commission 2015; Furness and Vollmer 2013*).

GLOBAL ALLIANCE FOR ACTION FOR DROUGHT RESILIENCE AND GROWTH: A comprehensive, multi-level approach coordinated by USAID, the Global Alliance includes 51 African governments and international and national donors. Seeking to address the prolonged drought crisis in the Horn of Africa, the Global Alliance supports the development of common frameworks for country and regional programming, regional capacity building, and monitoring and evaluation. For example, the government of Kenya has established a National Drought Management Authority to lead and coordinate its country plan. The government of Ethiopia is implementing new policies to protect livestock before droughts occur (*USAID 2014b*).

ENVIRONMENT AND SECURITY INITIATIVE (ENVSEC): A partnership of six international organizations, ENVSEC provides an integrated response to environment and security challenges by strengthening cooperation in four regions: Central Asia, Eastern Europe, the Southern Caucasus, and Southeastern Europe. ENVSEC helps identify common solutions and facilitates transboundary dialogue and collaboration among policymakers, environmental experts, and civil society. Most recently, the initiative has supported the consideration of climate change adaptation concerns in the management of the transboundary Neman River basin in Eastern Europe. While integration is key to ENVSEC, the design of most of its projects does not address both environment and security (*Maas and Carius 2012*).

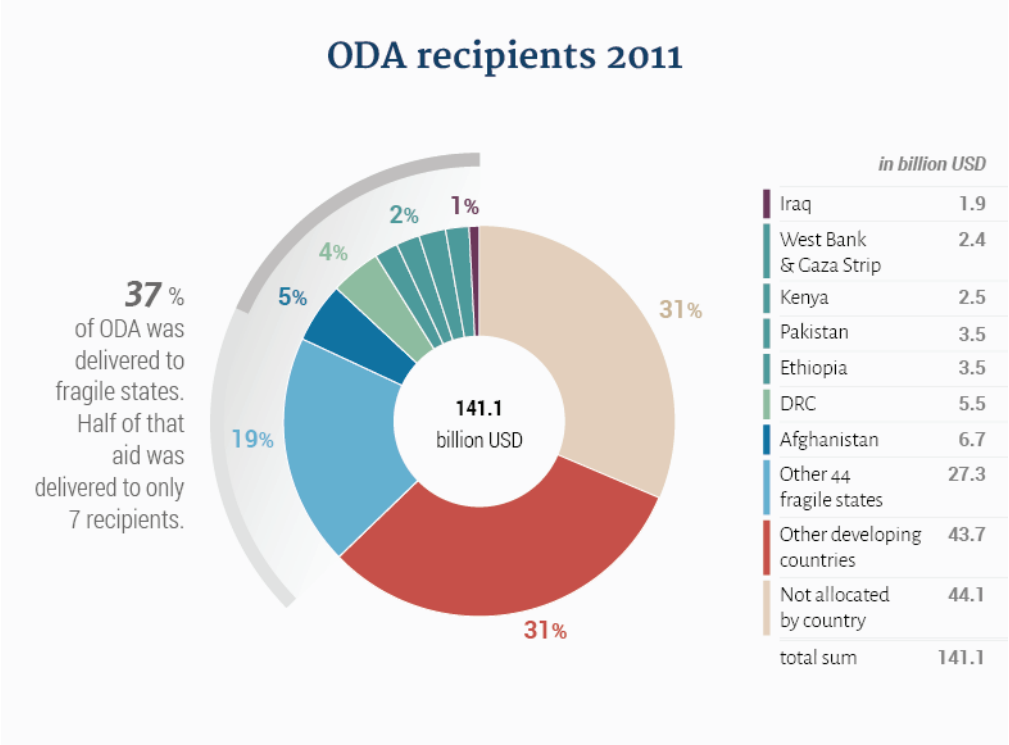
We can also use the current global process to develop the **international development and humanitarian aid** agenda to further support better integration.

THE POST-2015 DEVELOPMENT AGENDA: The year 2015 offers a unique opportunity for integrating the challenges of climate change and fragility into the broader development agenda. The post-2015 agenda could provide new momentum and direction for global development financing under an umbrella for global action. While the compound risks identified in this report are mostly addressed in the proposed list of goals—including climate change adaptation targets—the post-2015 process does not yet address ways to overcome the siloed approach to sustainable development that keeps its three dimensions (social, economic, and environment) separated. Only a few of the proposed goals (on energy, inequality, and cities) cross dimensions and sectors. It is also unclear how member states will contribute to achieving these goals, which has also been one of the major shortcomings of the Millennium Development Goals (*Bauer et al. 2014*). Based on the draft list, there are obvious entry points for ensuring better integration of planning processes at the national and international levels, such as coordinating humanitarian interventions and development programming.

3.2.3 Financing

The current patterns of development financing—whether for fragile states or climate-sensitive sectors—face major challenges in achieving the goal of adequately addressing the climate-fragility risks described in this report. As outlined by the OECD (*2014a*), aid to fragile states is volatile and many fragile states are under-funded, whereas a few focus countries have received most of the money. In general, fragile states have only very limited capacities to generate revenues domestically, and the absorptive capacity for international support is limited.

OVERALL AID TREND: Between 2000 and 2010, per capita official development assistance (ODA) increased by 46 percent in states that are identified as fragile by the OECD, compared with a 27 percent increase in states that are not considered fragile (*OECD 2013b*). Global aid to fragile states began falling after reaching a peak in 2005. In 2011 it fell by 2.4 percent (*OECD 2014a; OECD 2013c*). However, recent OCED data indicate that aid has increased since 2011. Currently, a significant share of ODA is devoted to fragile states, which reflects the reality that poverty, and efforts to alleviate it, are increasingly concentrated in these countries (*OECD 2014a*).



› **Source:** OECD (2014a)

AID FOR CLIMATE-SENSITIVE SECTORS: Over the past decades, aid for certain climate-sensitive sectors has decreased. In recent years, agricultural aid represented only 5 percent of total ODA commitments—well under the 20.2 percent share it had during the 1987–89 period (*Elliot and Collins 2012*). The share of ODA devoted to agriculture is particularly low in fragile states. For example, ODA for Burundi's agricultural sector in 2010 was about 1 percent, although the sector employed 90 percent of the country's workforce (*Boyce and Forman 2010*). Of US$42.4 billion bilateral DAC commitments to social infrastructure and services in 2011, water and sanitation received only about US$4.9 billion (*OECD 2013a*). Since 1990, aid for water and sanitation has increased by 16 and 20 percent, respectively. There is a strong regional focus for these sectors, with Sub-Saharan Africa receiving 25 percent and South and Central Asia receiving 23 percent of total aid in 2011. Although progress in providing access to drinking water over the past two decades has been remarkable, more than 10 percent of the global population still lacks access to safe drinking water (*OECD 2013a*).

UNEVEN DISTRIBUTION AMONG FRAGILE STATES: ODA for OECD fragile states has been unevenly distributed and highly volatile (*Pietschmann 2014*). About half of all the ODA disbursed to fragile states went to only seven countries in 2011: Afghanistan received US$6.7 billion; the DRC received US$5.5 billion; and US$13.8 billion was disbursed to Ethiopia, Pakistan, Kenya, the West Bank/Gaza, and Iraq. The other half was disbursed to the other 44 fragile states (*OECD 2014a*). A new OECD methodology combines needs and performance criteria to create a list of potentially under-funded countries, which clearly shows that countries identified as fragile (and the Sub-Saharan countries in particular) do not receive sufficient funding (*OECD 2013b*).

LIMITED ABSORPTIVE CAPACITY: A critical and disputed point is the lack of absorptive capacity in countries that experience fragility. Aid can have negative macro-economic effects if monetary and fiscal policies do not take aid flows into account. As the OECD (*2008b, 28*) reports, 'Weaknesses in transparency and accountability and the lack of sound public financial management systems generate additional constraints, both in themselves and in combination with the reporting and financial requirements of donors'. The limited research available suggests that the absorptive capacity

COMMITMENTS AND APPROVALS BY MULTILATERAL DEVELOPMENT BANKS TO FRAGILE STATES IN 2013

Multilateral development bank	Lending arm	Total commitments[3] and approvals[4] to countries of operation (USD million)	To fragile states (USD million)	Percentage of total commitments and approvals to fragile states
World Bank	IBRD	12,970.58	0	0%
	IDA	53,405.14	6,722.55	12.59%
African Development Bank	AfDB	1,832.17	717.87	39.18%
	ADF	2,261.48	1,794.45	79.35%
Asian Development Bank[5]	ADB	10,302.9	2,374.9	23.05%
	AsDF	3,850	2,867.2	71.50%
Inter-American Development Bank	IDB (OCR and Funds)	13,597.5	192.0	1.41%
Caribbean Development Bank	CDB (OCR and Funds)	132.78	13.71	10.32%

› Sources: World Bank (2014d); AfDB (2014c); ADB (2014); Inter-American Development Bank (2014); Caribbean Development Bank (2014). This breakdown is based on the list of fragile states published by the OECD (2014) in its report on fragile states.

3 Commitments (IBRD) are the sum of new commitments on public and publicly guaranteed loans from the International Bank for Reconstruction and Development (IBRD) in 2013. Data are in current US dollars. Commitments (IDA) are the sum of new commitments on public and publicly guaranteed loans from the International Development Association (IDA) in 2013. Both IBRD and IDA data on commitments are in current US dollars.

4 Approvals by the African Development Bank (AfDB / ADF) are loan and grant approvals. Approvals by the Asian Development Bank (ADB) are the sum of loans, guarantee and equity approved; for the Asian Develoment Bank's Fund (AsDF) approvals are the sum of loans and grants approved. Approvals by the Inter-American Development Bank (OCR and Funds) are total approvals. Approvals by the Caribbean Development Bank (OCR and Funds) are the sums of loans, contingent loans, equity, and grants (net).

5 Data were converted from the ADB's units of account to US dollars based on market exchange rates as of December 30, 2013.

of countries that experience fragility may be only about 15 – 30 percent of GDP (*OECD 2008b*). The capacity to better manage aid could play a catalytic role in increasing ODA and leveraging other forms of private and public funding (*Pietschmann 2014*).

MULTILATERAL ORGANIZATIONS HAVE INCREASED THEIR FOCUS ON CLIMATE CHANGE AND FRAGILITY: The World Bank announced that it will increase its funding on climate change and for countries experiencing situations of fragility (*World Bank 2013*). The African Development Bank introduced a Fragile States Facility in 2008 and a new strategy, Addressing Fragility and Building Resilience in Africa, for 2014 to 2019, that takes into account different situations of fragility, pockets of fragility within a country, and the diversity of pressures contributing to fragility, including environmental issues and climate change (*AfDB 2014a*). The table above provides an overview of commitments and approvals made by the multilateral development banks to fragile states in 2013.

OECD–DAC PRINCIPLES FOR GOOD ENGAGEMENT IN FRAGILE SITUATIONS: The OECD-DAC principles (*2007*) 'stress that aid should be flexible, long-term, harmonized, and integrated in such a way as to bridge humanitarian, recovery, and longer-term development phases of assistance' (*Mcloughlin 2012*). In the humanitarian field, 19 active country-based pooled funds—Common Humanitarian Funds and Emergency Response Funds—provide grants to humanitarian NGOs and UN agencies based on a comprehensive consultation and prioritization process. Globally, the Central Emergency Response Fund also provides funding, especially for neglected or under-funded crises. Together, these pooled funds allocated US$920 million (7.2 percent of global humanitarian funding) in 2012. The agriculture, food, and water and sanitation sectors received 44.7 percent of the pooled funds (*OCHA 2013*).

We can also use the current global focus on **financing for development** to further support better integration.

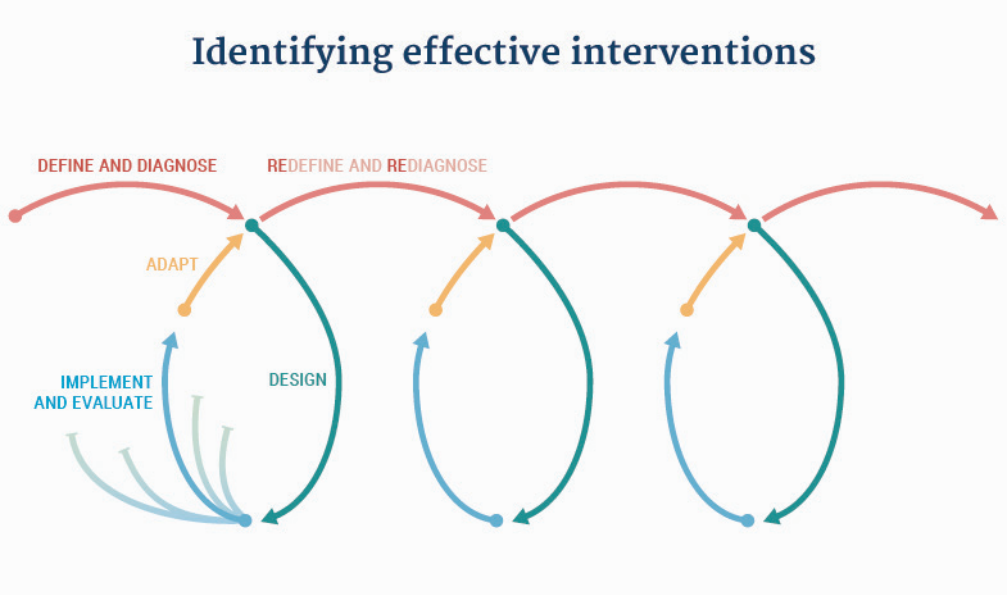
FINANCING FOR DEVELOPMENT CONFERENCES: The first conference on Financing for Development, held in Monterrey in 2002, sought new approaches to funding more equitable global development, leading to the adoption of the Monterrey Consensus. In July 2015, the third conference on Financing for Development, which will take place in Addis Ababa, is expected to substantially contribute to the post-2015 development agenda and its implementation. It is important that these conferences continue to recognize the unique needs of countries in situations of fragility and include this consideration in the overarching conversation.

3.2.4 Implementation

The OECD claims that the success rate of aid programmes in fragile states has been increasing over the last two decades (*Hilker 2012*). Still, aid programmes will arguably fail more often in situations of fragility. But when they succeed, the returns are likely to be far greater because the needs are so great (*World Bank 2011*).

Implementing projects in fragile situations requires allowing more time to deal with unanticipated security issues, frequently changing governments, or slow responses from executing agencies. It is important to strengthen engagement and dialogue with local institutions and stakeholders, including customary and traditional institutions. Furthermore, programmes need to be able to respond to such implementation challenges quickly (*ADB 2010; Bellina et al. 2009; International Peace Institute 2012*).

It takes time to build the capacities and institutions necessary to sustain development efforts. Project designs must be flexible because the fluid conditions in countries with situations of fragility often lead to changes in scope. There is no 'one-size-fits-all' solution for fragile states (*Leader and Colenso 2005*). We know too little about what works best in fragile contexts. The keys to success include a strong monitoring and evaluation process and a long-term commitment. The aid instruments that have proved to be most successful have been developed through several cycles of reform and adaptation (*World Bank 2015c*).



› Adapted from World Bank (*2015c*)

One of the largest obstacles to the successful implementation of integrated development projects is the lack of expertise, capacity, and resources. To implement more complex project designs and ensure adaptation to changing contexts, implementers need to understand fragility and engage more deeply in the context (*Stephen 2014*). In the past, most multilateral and bilateral donors concentrated on developing guidelines and setting minimum standards. While these often produced better incorporation of fragility and climate risks in strategies, they did not necessarily produce better programmes. On the implementation level, this higher level of awareness has not produced more resources, time, or staffing.

PROBLEM-DRIVEN ITERATIVE APPROACHES: One way to deal with the fragile environment is to include evaluation as an ongoing element of the implementation process. Instead of implementing best practices, this approach calls for solving locally identified performance problems. The approach encourages trial and error rather than fixed and predefined programming (see infographic above). It embeds tight feedback loops to enable rapid learning, as opposed to post-programme evaluation, and it actively engages a broad range of agents to facilitate viable and legitimate bottom-up programmes (*Andrews et al. 2012*). However, while these and other innovative approaches to complex environments are increasingly promoted by academia, they have not yet found their way into the operational practice of development agencies.

On the other hand, there are ongoing efforts to find **new ways of implementation** that can also help address climate-fragility risks.

THE UN'S 'DELIVERING AS ONE': Launched by the UN in 2005, this initiative seeks to reduce the burden on partner countries by coordinating different agencies' operations and bureaucratic procedures. Thematic working groups and country teams ensure inter-agency coordination and decision-making at the country level. Each country team presents one nationally owned strategy, based on joint analysis, joint thinking, joint prioritization, and joint budgeting. But despite abandoning siloed approaches within the UN system, Delivering as One has not integrated important climate policy areas. The specific ways it reduces the burden on partners are still unclear, and there are limits on its ability to tackle climate-fragility risks. The Delivering as One approach brings together climate knowledge and public awareness, but it does not integrate conflict sensitivity or broader

development efforts. In addition, the lack of monitoring and evaluation capacity does not allow for reliable conclusions on the programme's effectiveness in fragile situations (*UN System Chief Executives Board for Coordination 2008*).

WORLD BANK GROUP: The recognition of the links between fragility, conflict, violence, and poverty has grown within the World Bank Group. It is beginning to take more risks in countries experiencing situations of fragility. While efforts to draw on fragility and conflict analyses to formulate country assistance strategies have substantially increased, these insights and lessons have not yet been consistently applied at the programme and project level. More flexible approaches are needed; as one report noted, 'Attention to fragile and conflict-affected situations within the banks has increased, but it has not resulted in a systemic shift in internal approaches to project-financing behaviour on the ground' (*Stephen 2014, 9*).

THE EU'S SHARE INITIATIVE: Supporting the Horn of Africa's Resilience (SHARE) is a joint humanitarian-development approach managed by the EU Commission's Humanitarian Aid and Civil Protection (ECHO) and International Cooperation and Development (DEVCO) departments. The initiative, launched in 2012, seeks to improve food security, nutrition, and livelihoods in a climate-proof way, including the implementation of national resilience approaches included in national development plans. The €270 million project coordinates aid delivery by involving local and regional authorities as well as intergovernmental bodies such as the Intergovernmental Authority on Development (*ECHO 2014*).

DFID IN THE DRC: Since linear and static approaches have been found to be less effective in fragile contexts like the DRC, DFID has begun applying the principles of complex systems thinking to its £100 million Private-Sector Development Programme, which is more suitable for fluid contexts. DFID's 'complexity theory of change' includes adaptive management approaches, complex systems principles for programming in situations of fragility, a problem typology matrix, strategic planning horizons, and resilience principles. After conducting a systemic analysis of the private-sector environment in the DRC, DFID identified four areas for intervention: access to finance, market environment, business development, and corruption. DFID's DRC programme adopted a flexible, adaptive management approach. Overall, the tools applied by the pilot proved to be more suited to the dynamic, uncertain context in the DRC than the techniques that were previously employed (*Ramalingam et al. 2014*).

Sectoral Approaches: Transboundary Water

Transboundary water management is an issue that crosses all three of the policy areas analysed in this chapter. So far, the development community has had the deepest engagement with shared waters. Yet greater integration with climate adaptation and peacebuilding objectives could generate significant synergies.

Transboundary waters lack an 'institutional home' at the global scale. There is no organization or international forum that would enable integrated and systematic assessment, let alone drive coordinated action. Responsibilities are split across numerous international institutions, leading to fragmentation and a lack of agency, as there are no 'effective international structures that are able and willing to systematically address the present and future challenges and opportunities of transboundary waters' (*Pohl et al. 2014, 20*). This lack of agency has contributed to approaches that are less comprehensive than they could be.

At the basin level, the situation is somewhat different. The 117 river basin organizations (RBOs) provide institutions for coordination of almost half the world's 276 transboundary basins. However, these RBOs do not always include all countries in a basin, and numerous basins do not have institutionalized mechanisms in place for solving climate, development, and security-related issues. Moreover, many existing mechanisms are not well suited to address the hydrological changes that climate change will spur in many places, as well as the political challenges that may arise as a consequence of development and fragility pressures. Many agreements on shared waters allocate specific water volumes, which may not be available in the future, or lack dispute settlement mechanisms (*Schmeier and Schulze 2012*).

Primary responsibility for strengthening cooperation on shared waters lies with the basin countries. In seeking to strengthen cooperation, riparian countries can draw on existing legal arrangements, such as the 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses, the UNECE Water Convention, and the EU Water Framework Directive. Although most countries have been reluctant to ratify the UN Convention, which entered into force in 2014, the principles embodied in these texts provide useful guidelines for framing cooperative approaches to shared waters (*United Nations 2015*).

Given the multiple benefits of cooperation, the international community has sought to support it. Many RBOs are thus financed by international donors, and often there are effective forums for donor coordination at the basin level. Yet increasing the effectiveness of international support depends on using international policy and processes to take advantage of the multi-dimensional opportunities that transboundary water management offers.

3.3 Peacebuilding

INTEGRATING CLIMATE ADAPTATION INTO PEACEBUILDING POLICIES	
Stage	**Peacebuilding policies**
Early warning and assessment	While the security community is calling for a better understanding of the links between climate and fragility at the highest levels, climate change is not sufficiently reflected in fragility or peace and conflict assessments.
Strategy and planning	A holistic understanding of resilience and peacebuilding is growing. Initiatives like the New Deal that take a multi-stakeholder approach to building resilience can be encouraged to fully reflect the consequences of climate change.
Financing	Multi-donor trust funds can help coordinate donors, harmonize aid, create country ownership, and mobilize resources. However, cases of using these funds to systematically address climate change-related risks are rare.
Implementation	Climate-sensitive peacebuilding is still in the pilot phase, with promising case studies at the local and transboundary levels.

Climate change impacts can affect peacebuilding in several ways (*Matthew and Hammill 2012; UNEP 2009*). On one hand, ongoing peacebuilding operations may be undermined by climate change impacts; for example, if the natural resource base is degraded, it may be more difficult for societies to recover from conflict. On the other hand, addressing climate change impacts may change the way peacebuilding operations are organized and implemented, improving the capacity of societies to better cope with additional stress. This kind of approach can strengthen resilience by improving early warning capacities and enabling a long-term planning and implementation perspective.

3.3.1 Early warning and assessment

Assessing peace or fragility across countries is sometimes dismissed as a purely academic or formal exercise. Yet, analytical approaches to peacebuilding are a prerequisite for fulfilling the 'do no harm' principle when working in a fragile situation.

THE UN SECURITY COUNCIL: In 2007 and 2011, the UN Security Council expressed concern that the possible adverse effects of climate change could, in the long run, aggravate existing threats to international peace and security. In 2011, the council called for early warning capacities and integrated assessment of the risks of climate change and fragility, and requested that the Secretary-General include such contextual information in his reports (*UNSC 2007; UNSC 2011*). Internal discussions to develop a 'how to' guide for reporting on contextual information related to the security implications of climate change have revealed that UN initiatives, like the Secretary-General's Sahel initiative in 2013, increasingly consider climate change impacts as major drivers of political instability.

PEACE AND CONFLICT ASSESSMENTS: A comparative study found 66 different assessment tools with a focus on climate change, natural resources, and conflict (*Peters and Vivekananda 2014*). However, only two of these tools were found to integrate all three dimensions: a training course by the United Nations Institute for Training and Research, and the post-conflict environmental assessments of UNEP's Post-Conflict and Disaster Management Branch. Only a minority of the many different peace and conflict assessment methodologies include environment and climate change. In practice, peace and conflict assessments are often just a formality conducted by an external expert, with the results rarely informing strategies, planning, and implementation.

INTERNATIONAL DIALOGUE ON PEACEBUILDING AND STATEBUILDING AND THE G7+ FRAGILITY ASSESSMENTS: In 2011, the New Deal for Engagement in Fragile States, which was developed through the International Dialogue on Peacebuilding and Statebuilding, was born out of the recognition that development efforts were not sufficiently addressing the root causes of fragility (*Hughes et al. 2014*). As part of the g7+ process, some of the 20 member countries have developed fragility assessments, defined as 'an inclusive and participatory exercise carried out by national stakeholders to assess a country's causes, features, and drivers of fragility as well as the sources of resilience within a country' (*International Dialogue on Peace and Statebuilding 2014*). A number of countries have conducted fragility assessments, including the DRC, Comoros, Liberia, Timor Leste, South Sudan, and Sierra Leone. Three countries—Somalia, Afghanistan, and Sierra Leone—have established compacts that identify their priorities and principles to follow based on the assessments, which vary in the extent to which they incorporate New Deal principles (*Hughes et al. 2014*).

For the g7+ fragility assessments, the inclusion of climate vulnerability could be a major entry point. However, the inclusion of climate change-related trends in the fragility assessments is currently very limited. This may be due to the pressure to complete the first assessments very quickly and to use a methodology that is not too complex for local stakeholders to use. However, if the country's overall peacebuilding strategy is based on these fragility assessments, then adapting to potential climate change impacts should be recognized as a key step to sustainable peace.

3.3.2 Strategy and planning

While the environment, natural resources, and climate change have become increasingly relevant to peacebuilding, it may be too early to label any existing plans or strategies successful examples of integration. However, some of these approaches have enabled partners to take a stronger resilience-oriented perspective. Insights from practitioners working in the DRC, Rwanda, and Sierra Leone demonstrate that it is critical to integrate climate change into peacebuilding interventions (*Matthew and Hammill 2012*). Failure to introduce climate change adaptation into peacebuilding in these countries would mean that decisions with long-term consequences would not take into account the potential effects of climate change.

PEACEBUILDING AND STATEBUILDING GOALS: As part of their fragility assessments, the g7+ member countries are developing specific priorities and indicators based on a common set of Peacebuilding and Statebuilding Goals (PSGs; see the box below). The country-specific PSGs and indicators will serve as the framework for addressing the challenges of fragility, development, and resilience, both within countries and within multilateral and bilateral development agencies. The g7+ initiative illustrates how difficult it is to incorporate PSGs into national plans. Donors and civil society expected the PSGs to form the basis of an ongoing dialogue, both within g7+ countries and between g7+ countries and donors. However, this dialogue has not yet occurred, partly because civil society is not a full partner in the New Deal for Engagement in Fragile States and has not been meaningfully engaged on the PSGs and causes of fragility. A stronger focus on the relevance of climate change adaptation for the PSGs and the importance of a multi-stakeholder approach for resilience building may revive the initiative's New Deal character (*International Dialogue on Peacebuilding and Statebuilding 2011*).

The five Peacebuilding and Statebuilding Goals:

- Legitimate and inclusive politics: Foster inclusive political settlements and conflict resolution.
- Security: Establish and strengthen people's security.
- Justice: Address injustices and increase people's access to justice.
- Economic foundations: Generate employment and improve livelihoods.
- Revenues and services: Manage revenue and build capacity for accountable and fair service delivery.

THE UN'S INTEGRATED STRATEGY FOR THE SAHEL: This high-profile initiative seeks to coordinate responses to security, governance, development, human rights, and humanitarian challenges in the Sahel region (*OCHA 2014*). As part of the integrated strategy, three working groups coordinate the implementation of governance, security, and resilience programmes. Food and nutrition receive a major share of the funding. The 2011 UNEP report *Livelihood Security, Climate Change, Migration, and Conflict in the Sahel* analyses the historical climate trends in the Sahel and offers recommendations for improving understanding of conflict and migration trends in adaptation efforts across the region (*UNEP 2011b*).

EU ACTION PLAN FOR RESILIENCE IN CONFLICT-PRONE COUNTRIES, 2013–20: Produced by the European Commission and the European External Action Service in 2013, the EU Action Plan seeks to improve peace and statebuilding, climate protection, disaster risk reduction, food security, and social protection. The plan is based on a holistic approach of building resilience in conflict-prone contexts by focusing on the most affected population groups. Select flagship initiatives focus on a variety of risks, including droughts and floods, cyclones, and earthquakes, as well as conflict and instability (*European Commission 2013a*).

THE UK GOVERNMENT'S 'WHOLE-OF-GOVERNMENT' APPROACH TO STABILIZATION: The UK's Stabilisation Unit brings together expertise from the Foreign and Commonwealth Office, the Ministry of Defence, and DFID to facilitate an integrated approach to conflict and instability. The Stabilisation Unit deploys civilian experts and core staff to bilateral or multilateral posts to support joint strategies and activities. While the Stabilisation Unit uses a combination of civilian and military actions to protect and promote legitimate political authority, it is usually civilian-led. The stabilisation approach has three core goals:

- Protect political actors, the political system, and the population;
- Promote, consolidate, and strengthen political processes;
- Prepare for longer-term recovery.

An internal review of the Stabilisation Unit concluded that the leadership of the unit should be strengthened and the three participating departments should provide increased strategic direction (*FCO et al. 2014*).

3.3.3 Financing

Financing in fragile contexts is challenging and requires tailor-made solutions, as discussed in the section on development financing. A number of multi-donor trust funds (MDTFs) finance peacebuilding activities and deserve further attention.

The most recent call for better integration of humanitarian, development, and climate finance, which was published by the UNDP Multi-Partner Trust Fund Office (*Bayat-Renoux and Glemarec 2014*), reports that pooled financing mechanisms like MDTFs are key to aligning efforts across a wide range of actors and fostering synergies across humanitarian, development, and climate support activities, especially for recovery. The main constraints of MDTFs are that they do not cover the majority of countries and that they are too small and fragmented to support aid coordination and alignment. The options for increasing the impact of recovery support includes consolidating a large number of small recovery pooled funds into fewer, larger pooled funds, which could create a critical mass of resources for coordinating recovery interventions across all three sources of finance (*Bayat-Renoux and Glemarec 2014*).

MDTFs seek to harmonize aid and can help avoid overwhelming the absorptive capacity of countries facing situations of fragility. However, the compound climate risks identified in this report are not systematically reflected in any of the MDTFs that focus on peacebuilding. Some address climate change as part of their disaster work, while others address the role of natural resources in post-conflict contexts. In addition, despite some encouraging results, there is still some scepticism about their effectiveness.

UN–WORLD BANK FRAGILITY AND CONFLICT PARTNERSHIP TRUST FUND: This multi-country, multi-donor trust fund was established in 2010 to improve cooperation between the UN and the World Bank in fragile and conflict-affected contexts. Since 2010, the fund has received US$11 million. While the fund has increased understanding of each organization, in general it seems to suffer from a lack of systematic and comprehensive collaboration, especially at senior levels, due to weak institutional incentives (*United Nations and World Bank 2014*). Moreover, climate change has not yet been a topic addressed by the fund's activities; only a 2013 expert meeting on conflict, violence, and disasters as part of the post-2015 development agenda has been funded.

UN PEACEBUILDING FUND: Launched in 2006, the UN Peacebuilding Fund seeks to build peace in countries emerging from conflict by focusing on the very early transition phase. It fills funding gaps by focusing on quick delivery in under-funded countries. Through its activities, which include addressing immediate threats to peace and promoting peaceful conflict resolution, the fund has

addressed some of the compound risks in this report, such as land conflicts in Liberia, the DRC, and Nepal (*United Nations Peacebuilding Fund 2014*). While it has not always met its high goals, its overall performance is considered good (*Kluyskens and Clark 2014; Government of the United Kingdom 2011*). The fund is managed by the Peacebuilding Support Office and administered by UNDP's multi-partner trust fund. Twenty-three countries received support from the fund in 2013. It allocated on average US$71 million each year between 2011 and 2013. Nearly 90 percent of its money has been disbursed to 17 African countries (*United Nations Peacebuilding Fund 2014*).

UNDP THEMATIC TRUST FUND FOR CRISIS PREVENTION AND RECOVERY: Designed to respond quickly to a disaster or violent conflict, this UNDP fund bridges the gap between emergency relief, peacebuilding, and long-term development. It helps governments analyse the increased risk of disaster through climate change. Contributions to the fund amounted to about US$97 million in 2012 and US$67 million in 2013. While 95 countries received money, 15 countries received 60 percent of it (*UNDP 2012a*; *UNDP 2013b*).

COUNTRY-SPECIFIC MULTI-DONOR TRUST FUNDS: The DRC's Stabilization and Recovery Trust Fund (closed in 2014), the Darfur Community Peace and Stability Fund, and the UN Peace Fund for Nepal are country-specific trust funds. In Nepal, almost US$45 million — from the UN Peacebuilding Fund and the governments of Canada, Denmark, Norway, Switzerland, and the United Kingdom — was allocated through 26 projects implemented by 14 UN agencies by the end of 2013 (*UNPFN 2013*). Between 2008 and 2012, 31 UN agencies and NGO partners supported the Darfur Community Peace and Stability Fund with more than US$51 million (*Darfur Community Peace and Stability Fund 2012*). In the case of Nepal, the trust fund did not focus on climate-related risks, but the Darfur fund tried to facilitate cooperation between communities over disputed livelihood assets and income-generating activities, as well as between competing communities over access to natural resources and basic social services.

INSTRUMENT CONTRIBUTING TO STABILITY AND PEACE (ICSP): The IcSP, successor to the EU Instrument for Stability, is one of the EU's key tools for preventing and responding to crises. It is based on the principle that 'future work on security and development should include the security and development implications of climate change, environmental and natural resource management issues, and migration' (*European Commission 2014*). The IcSP can provide short-term assistance in countries where a crisis is unfolding, or long-term support through conflict prevention, peacebuilding, and crisis preparedness. It can also address global and trans-regional threats to peace, international security, and stability. It explicitly states that the global and trans-regional effects of climate change will have a potentially destabilizing impact on peace and security, and stresses the need to address climate change in fragile contexts as a means to prevent conflict. The funding for the IcSP is €2.3 billion for the period 2014–20. While the IcSP acknowledges the potential fragility risks posed by climate change, it plans to only spend €11 million on climate change and security from 2014 to 2017 (*EPLO 2014*).

In sum, MDTFs have facilitated donor coordination and harmonization, created ownership, and mobilized resources in post-conflict situations where many donors are not willing to commit (*Barakat et al. 2012*). For example, an independent review found that the MDTF for Nepal has made UN contributions to peacebuilding more efficient and consistent by pooling the efforts of multiple UN implementing agencies (*UNODC 2011*). Rapid decision-making and implementation of peacebuilding activities were facilitated through this common financing mechanism. Moreover, the fund has strengthened inter-agency cooperation. However, funding for gender issues has remained very low, and needs to be increased to meet the UN Secretary-General's 15 percent target for gender inequality (*UNODC 2011*). In Darfur, the trust fund was constrained by the rapidly changing security situation, a lack of female participation, inadequate staffing, and a lack of capacity among the implementation partners (*Coffey International Development 2012*).

However, there is still some scepticism when it comes to the effectiveness of MDTFs. A combination of complex contexts, unrealistically high expectations, and a lack of country participation in their design has impeded the efficiency and success of MDTFs (*Stepputat and Greenwood 2013*). Under pressure to disburse funds quickly (especially in strategically important countries such as Afghanistan and Iraq), the MDTFs have suffered from 'poor standards of implementation, weakening aid effectiveness and contravening state-building objectives' (*House of Commons 2013*). In Sudan, MDTFs have distributed funds too slowly, leading to decreased donor support. MDTFs must be based on a better analysis and understanding of the complex risk landscape and designed around a strong programme theory with clear goals (*Barakat et al. 2012*). MDTFs and their cumbersome bureaucracy favour larger organizations, such as the UN, and tend to exclude local NGOs (*Bennett et al. 2010*).

3.3.4 Implementation

While there are limited lessons from climate change programmes in fragile contexts, we can draw upon some experience linking broader environmental programmes and peacebuilding. In principle, peacebuilding efforts should be climate-sensitive. Climate-proofing peacebuilding requires practitioners to integrate climate-change considerations into their programmes. A climate-sensitivity check could keep peacebuilding interventions from further contributing to GHG emissions. More importantly, such a process could identify ways in which climate change adaptation programmes could support the peacebuilding process.

FOSTER STRATEGIC ENGAGEMENT WITH NEW ALLIANCES: Evaluations of the World Bank's and the UN's engagement in fragile contexts have shown that they tend to work mostly with central governments. While the central government is a key actor, peacebuilding issues should be resolved in an inclusive, participatory, and transparent process, thereby strengthening the accountability and legitimacy of the national government and building trust between the state and its citizens. To this end, bilateral and multilateral aid agencies can place more emphasis on engaging other actors, such as parliament, local governments, and civil society (*Batmanglich and Stephen 2011*).

UNEP'S ENVIRONMENTAL PEACEBUILDING INITIATIVE: Recognizing that natural resources and environmental issues can contribute to violence and conflict, UNEP has developed training programmes on natural resources and conflict for peacekeeping troops, UN Country Teams, and EU staff. If managed well, natural resources can support economic recovery by strengthening post-war economies. However, donor agencies need to build the capacity of national authorities to manage resource extraction and generate revenues without increasing the risk of conflict. Accountability, transparency, and environmental sustainability are critical to success. UNEP provides field support on environment-peacebuilding linkages to countries where the UN Peacebuilding Commission is active. It established the Expert Advisory Group on Conflict and Peacebuilding to support projects with best practice examples and to develop tools and policy inputs that contribute to peacebuilding and prevent conflict relapse. One key lesson learned is that environmental peacebuilding (like climate adaptation) is not just a technical, legal, or administrative challenge but also a political one. Changes in natural resource management often go hand-in-hand with redistributing power, resources, and opportunities (*UNEP 2014a; UNEP 2014b*).

THE GOOD WATER NEIGHBOURS PROJECT: In 2001, Friends of the Earth Middle East established an initiative to improve water cooperation among Jordanians, Palestinians, and Israelis. The mutual dependence of cross-border communities on shared water resources is the basis for developing dialogue and cooperation on sustainable water management between the groups. The goal is to improve environmental sustainability while creating economic co-benefits and building peace. Despite the challenges of dealing with deep-seated grievances on all sides and operating in active war zones, this project is widely recognized as a leading example of best practices in the field of environmental peacebuilding. Future climate change impacts, however, have not yet been an explicit focus of the project (*Harari and Roseman 2008*).

WATER UNITES INITIATIVE: The Transboundary Water Management in Central Asia Programme, which was launched in 2008 by the German Federal Foreign Office, seeks to address water challenges through regional cooperation. One component of the programme focuses on applying the basic principles of river basin management to small transboundary rivers. In the Isfara and Khodzhabakirgan basins, which are shared by Tajikistan and Kyrgyzstan, the programme has supported both countries' efforts to coordinate river basin planning and management, including a framework agreement to establish a Joint Water Commission (*GIZ 2013*).

USAID PEACE CENTERS FOR CLIMATE AND SOCIAL RESILIENCY IN ETHIOPIA: USAID's Peace Centers for Climate and Social Resiliency initiative in southern Ethiopia has started to use dialogues on climate-related resource challenges as a mechanism for addressing inter-group tensions among pastoralist groups. This approach to conflict prevention, which is tailored to local circumstances, could be extended to other ethnically diverse regions and climate-vulnerable communities. By engaging conflict-prone, marginalized communities, climate adaptation programmes can help to address the perceived lack of participation and representation that is a main source of instability in fragile situations. One key objective of the overall Global Resilience Partnership supported by USAID is to improve the collaboration between diverse local actors.

3.4 Conclusions

Overall, the responses to climate-fragility risks described above demonstrate some strengths, but many gaps prevent them from adding up to an effective whole.

Early warning and assessment

We do not know everything about the risks. But we know a lot, and by integrating our efforts, we can improve our early warning systems and assessments of climate–fragility risks.

There is a substantial amount of information about climate change and fragility connections. Our analysis shows that assessments often ignore certain dimensions: Vulnerability assessments do not look at transboundary issues and fragility. Fragility, peace, and conflict assessments generally do not consider climate change impacts; nor do they consider the co-benefits of climate change adaptation. Few assessment methodologies focus on both climate and fragility. And even when such assessments are conducted in a way that integrates attention to both issues, the findings are often not used effectively in planning or implementation.

The accuracy, speed, and reach of our early warning systems and our assessments of climate-fragility risks need to be improved. Integrated early warning and assessment capacities can more systematically collect data and conduct risk assessments. Integrated systems will also improve forecasts and dissemination of this information. But there is little guidance for integrated assessment of climate change trends in fragile contexts.

Strategy and planning

There are many plans, but little integration. Institutions in fragile situations must be strengthened so they are able to balance competing interests and conduct integrated planning.

Planning for resilience requires identifying and selecting the best activities over the medium to long terms. Establishing clear decision-making structures and building institutional capacity are priorities. A comprehensive planning process can avoid duplicating effort, prevent maladaptation, and enhance sustainable development. In addition, co-benefits of adaptation—like peace, health, and employment—can be identified and realized. Cross-sectoral approaches are more likely to build

resilience and avoid conflict than single-sector measures. Currently, however, at the regional level, there is no political process that can develop integrated answers to adaptation, development, and peacebuilding challenges.

Institutions provide the enabling environment for planning for climate adaptation—an important role highlighted most recently by the IPCC. The current process of formulating and implementing national adaptation strategies could be a valuable way to enhance perceptions of political legitimacy if conducted transparently, inclusively, and equitably. Without strong institutions, conflicting objectives may limit the ability to adapt to climate change in fragile contexts. To counter this risk, planning processes should include more diverse groups of stakeholders, including the most vulnerable groups. More comprehensive planning processes require more participation.

Countries experiencing situations of fragility often lack the tools to identify the institutional capacity they need. Raising awareness about climate change vulnerability and adaptation is a starting point to build that capacity. Particularly in fragile situations, integrated planning approaches can avoid fuelling local conflicts by incorporating conflict sensitivity and following the 'do no harm' principle.

Financing

Financial support for states experiencing situations of fragility is challenging. Although global climate finance is expected to increase substantially, it is not yet clear how these states will benefit, due to their limited capacities.

Financing—including private finance, development assistance, and peacebuilding funds—plays an important role in building resilience and fostering peace. Unpredictable funding, a lack of donor coordination, weak institutions, and siloed agendas are key challenges for many countries, but especially for those experiencing situations of fragility. Traditional aid delivery mechanisms are also difficult for countries with weak institutions and lacking capacities.

The global agendas on climate, sustainable development, peacebuilding, and other environmental issues are largely conducted through separate policy processes, fostering a proliferation of negotiation fora and sectoral funding streams, each with different operational procedures, fiduciary standards, and reporting requirements. This proliferation especially burdens overstretched states with weak institutional capacity. Additionally, traditional aid delivery mechanisms are especially difficult to manage for countries with weak institutions.

Better coordination among donors would help ensure that the money is spent efficiently and without duplication. Harmonizing aid flows would also address the increasingly complex reporting requirements from different donors.

Our findings indicate that countries with fragile situations have limited access to climate finance, which can be attributed to the high requirements of the climate funds, coupled with the weak institutional and administrative structures of the receiving states. To what extent this funding gap will be addressed by the Green Climate Fund remains unclear and needs to be closely monitored during the pilot funding period starting in 2015. Since the Green Climate Fund is supposed to ensure a regional balance and the main procedures for distributing financial resources are yet to be defined, it presents a window of opportunity to promote innovative financing mechanism in countries with situations of fragility.

Implementation

There are many pilot programmes, but there is little guidance based on lessons learned and best practices to help strengthen programme design and implementation. Implementation of integrated programmes should be based on a thorough understanding of fragility.

Adaptation, development, and peacebuilding programmes need to be built on a thorough understanding of climate-fragility risks, including the cross-sectoral integration of conflict-sensitivity and climate change considerations. Policymakers need to use a conflict-sensitive approach when implementing climate change adaptation measures and include climate change considerations when designing peacebuilding strategies and projects. Unfortunately, there is only limited guidance on how to apply a 'conflict-sensitivity' check in climate change adaptation policies or projects. Similarly, there is little practical guidance on integrating climate change considerations into peacebuilding policies and programs. Principles and best practice guidance are essential at the policy level, and guidance based on relevant field experience is particularly important at the project level.

In fragile and post-conflict environments, social networks and institutional relationships are generally weak or have completely broken down. Donors should emphasize building capacity and improving the accountability of state institutions.

Participation in implementation is critical. The involvement of stakeholders needs to be ensured at every step, from planning to implementation and monitoring. Stakeholders should include traditionally marginalized groups, the private sector, and the scientific community.

The humanitarian, development, and climate change communities must work together. The humanitarian community is working to integrate climate adaptation into humanitarian responses and disaster risk reduction programmes. Similarly, climate change adaptation strategies should incorporate disaster risk reduction frameworks and consider these activities eligible for adaptation funding.

4 Recommendations: A New Commitment for Resilience

Climate change constitutes a global strategic threat in the 21st century. This threat takes different forms as the consequences of climate change interact with the social, economic, and political contexts within different countries and across borders. Responses to climate change must therefore be multifaceted and cooperative to address the threat's complexity and geographic scope.

Achieving a robust agreement to reduce GHG emissions at the Paris Conference of Parties in December 2015 is of paramount importance. The amount of emissions that can still be released into the atmosphere without triggering serious consequences is very limited, and any delay in efforts will feed into the seven compound climate-fragility risks that this report outlines. The momentum of changes in the Earth's natural systems means that the physical impacts of anthropogenic climate change, which are already being felt, will continue for decades to come—however successfully we reduce emissions. The consequences of these impacts exacerbate the dynamics of fragility, including effects on social and political instability, insecurity, and violent conflict. Similarly, the consequences of fragility may hinder adaptation to climatic changes by the most vulnerable people, thus trapping them in a vicious cycle of climate-fragility risks.

This cycle will not be broken by piecemeal reactions to each crisis as it surfaces. Rather, human society—from the global level to villages and households—must equip itself to manage these compound risks. Though we can often identify the shape and scale of these risks, we need more than specific measures of adaptation, which are often reduced literally and metaphorically to building higher seawalls. We need the ability to be resilient in the face of a broad range of pressures, some of them unknown.

It is time for a new approach and new leadership from the highest level. Currently, governments' responses are typically reactive and aimed at specific threats or crises, and there is a lack of effective international institutions and mechanisms to coordinate or lead joint action on these cross-sectoral problems.

Building resilience is a challenge everywhere. Yet nowhere is this challenge greater than in situations of fragility, where basic government functions and constructive relations with society are lacking. Supporting states affected by fragility to build resilience against the compound risks described in this report requires integrating climate, development, and peacebuilding approaches. The gap analysis in the policy chapter demonstrates that there is significant scope to address these risks in a more integrated way.

This is in part because awareness of climate-fragility risks and the need for integrated approaches is not widespread. Moreover, integrated approaches are both new and often complex, so efforts to operationalize them tend to be challenging and are often accorded too low a priority. At the same time, there are few obvious national and international institutional homes for addressing these compound risks and, accordingly, there is a lack of high-level accountability for implementing integrated responses.

Many of the pressures identified in this report are increasing. At the same time, the necessary integrated responses are complex and will take considerable time to put in place. Therefore, it is urgent that action be taken now to raise awareness and encourage further action. The G7 has taken the first steps by demonstrating leadership on climate and security risks, and by commissioning this report. It is appropriate for the G7 to shoulder the responsibility of continuing on this path.

We recommend that the G7 governments commit to developing and implementing integrated approaches—for both prevention and response—to climate-fragility risks. The framework described in this chapter identifies concrete goals and actionable entry points at four different levels:

1. Within each G7 government
2. Coordination among G7 members
3. Informing global and multilateral processes
4. Working in partnership with a wide range of other actors and institutions, including in countries affected by fragility

We further propose five action areas, towards which this new multi-dimensional national and international process of coordination and cooperation for integrated responses can position itself:

- Global risk assessment
- Food security
- Disaster risk reduction
- Transboundary water disputes settlement
- Building local resilience

As the process of coordinating among the G7 governments and others develops, new possibilities and different priorities may well emerge. The specific recommendations that follow are, therefore, intended to illustrate what can be done and how, and are not necessarily either exhaustive or tightly prescriptive. What matters most is the headline action: a new political commitment by the G7 governments to align their efforts towards the common goal of increasing resilience and reducing fragility in the face of global climate change.

4.1 Recommendation 1: Integration begins at home
Make climate-fragility risks a central foreign policy priority

INTEGRATION BEGINS AT HOME	
Recommendation	**Make climate-fragility a central foreign policy priority.**
Priorities	• Improve capacities for compound risk assessment, monitoring, and integrated planning. • Improve cross-department coordination. • Encourage relevant foreign ministry principals to raise climate-fragility issues with foreign counterparts.
Entry points	• Establish cross-sectoral working groups and policy processes. • Conduct integrated multi-risk analyses at the global, regional, and country levels. • Pilot integrated approaches to address the compound risks.

The challenge of integration begins at home. To continue on the path that the G7 governments have rightly embarked upon of addressing compound climate-fragility risks, they need better ways of identifying, understanding, monitoring, and, above all, systematically addressing the climate-fragility risks described in this report. While a significant body of information on climate-fragility risks exists, in practice an integrated approach is not implemented for three reasons: The information is not disseminated to and absorbed at the right places; integration is not mainstreamed; and actions are not coordinated.

Accordingly, G7 foreign offices should strengthen their internal capacities to understand what foreign policymakers can do about this challenge, and how to implement integrated responses. Inter-agency groups that draw on the best knowledge available both across government departments and in think tanks, NGOs, the private sector, and academia will permit governments to deepen their risk monitoring and analyses and improve their capacities to respond. Within governments, this exercise would include not only the foreign ministries but also the development, environmental, and defence ministries and their implementing agencies. Ensuring coordination will be the key to success, so that different departments do not either duplicate their efforts or work at cross purposes. In external relations, the relevant foreign ministry principals should raise climate-fragility issues with their foreign counterparts.

Other actions for improving integration within the G7 governments include:

- Developing implementation guides and training for foreign policymakers, ministries, and implementing agencies as new policy approaches take shape.
- Mainstreaming climate-fragility issues into existing planning, implementation, and evaluation processes and indicators.
- Establishing cross-sectoral and cross-department working groups and policy processes, such as a coordination unit.
- Conducting compound risk assessments at the global, regional, and country levels.
- Directing bilateral aid agencies to pilot integrated approaches — such as conflict-sensitive adaptation projects — to address the compound climate-fragility risks.

4.2 Recommendation 2: Come together for a new dialogue
Enhance G7 cooperation

COME TOGETHER FOR A NEW DIALOGUE	
Recommendation	**Enhance G7 cooperation.**
Priorities	• Ensure closer coordination between the G7 members on climate–fragility risks. • Identify gaps and new opportunities for joint responses. • Define responsibilities and measure progress.
Entry points	• Mandate an annual review of integrated policies and programs. • Convene technical sessions on best practices and lessons learned. • Invest jointly in shared data sources and new research. • Jointly develop and use global risk assessments. • Continue to develop the existing G7 knowledge platform.

A problem that does not respect national borders can only be addressed with concerted inter-governmental action. But for all their strengths, no existing inter-governmental organization has the capacity to address the intertwined, compound climate-fragility risks. The scale and scope of these risks requires an injection of new energy in the short term, and this must be translated into sustained commitment in the longer term. The G7 is uniquely qualified to provide this leadership, because of its global status, the nature and breadth of its policy remit, and its shared commitment to these issues.

The task now is to ensure that climate and fragility risks move up to and stay at the top of the foreign policy agenda. A forum of G7 representatives can be established for regular reporting on progress, for sharing best practices and lessons learned, and for identifying next steps. This regular review within the G7 will help sustain the necessary momentum.

The initiative could begin with a strong political statement during the German G7 presidency, opening the way to an action-oriented task force. The task force will jump-start closer coordination between the G7 members by, for example, requiring an annual review of integrated policies and programs on climate-fragility risks, drawing on existing efforts to integrate climate change into related issue areas. Making this part of the annual G7 process would maintain the visibility and priority of responding to the compound risks of climate change and fragility and thus provide the G7 governments with a regular opportunity to exhibit leadership and further advance these efforts.

As we envisage it, the G7 task force would convene regular meetings of senior officials, with an agenda including analyses of current or potential climate-fragility hot spots and trends, reviewing relevant prevention and response policies and actions, comparing experience and sharing lessons, and identifying gaps and new opportunities for joint responses. This work could include, for instance:

- Jointly developing a global risk assessment methodology (see action area 1 below).
- Determining priority data needs and gaps.
- Identifying best information sources and/or collectively investing in new research.
- To collect and disseminate the annual reports, highlight best practices, and share new data sources, the G7 task force could build on the knowledge platform on climate and fragility risks commissioned by the G7 (www.newclimateforpeace.org).

4.3 Recommendation 3: Set the global resilience agenda
G7 task force informs global and multilateral processes and structures

SET THE GLOBAL AGENDA	
Recommendation	**The G7 task force informs global and multilateral processes and structures.**
Priorities	• Break down silos in multilateral institutions and in the post-2015 development agenda by integrating climate-fragility considerations. • Integrate climate change adaptation into relevant peacebuilding, conflict prevention, and humanitarian assistance programmes (and vice versa) to realize the potential co-benefits. • Ensure sufficient financing for addressing climate-fragility risks.
Entry points	• Explicitly cross-reference the new Sustainable Development Goals (SDGs), the newly adopted Sendai Framework on Disaster Risk Reduction, and climate change adaptation policies by, among other things, focusing on synergies between different institutions and frameworks. • Foster climate-sensitive and conflict-sensitive policies and programs in multilateral institutions and sectoral organizations. • Work together to help countries in situations of fragility prepare conflict-sensitive climate change adaptation plans and implement integrated resilience-building initiatives. • Encourage multilateral institutions to facilitate access to climate finance mechanisms for countries in situations of fragility, and ensure that ODA for these countries is less volatile and less unevenly distributed. • Ensure that financing instruments for peacebuilding, conflict prevention, and humanitarian assistance specifically earmark funds for programmes that address climate and fragility risks.

The global strategic threat and fragility implications of climate change are relevant for a multitude of international processes. In most of these processes, climate-fragility risks have been treated as a marginal topic. Through their collective weight, the G7 governments can help overcome the sectoral and siloed approaches that have characterized many of these processes and thereby help prevent effective responses to climate-fragility risks from falling through the cracks in the existing structure of international institutions. Foreign policymakers are not the only—and sometimes not the main—actors in these arenas. Yet they should seek to impart an overall sense of direction to their colleagues in the climate, development, and humanitarian communities, on the basis that the links between the different policy areas need strengthening in order to move the climate, development, and peacebuilding agendas forward.

Climate change has significant effects on development and peacebuilding. Development shortfalls threaten both climate adaptation and peacebuilding efforts. Conflict undermines economic development and climate adaptation. Accordingly, efforts to adapt to climate change, develop economies, and promote peace can and should have positive co-benefits for the other agendas. The G7 governments can help realize these co-benefits by promoting greater coordination between the climate, development, and peacebuilding processes. However, as they do so, they must be mindful of the need not to overburden governments, especially those in fragile situations, with duplicative planning and reporting requirements. An integrated response should lead to streamlining.

Areas in which this approach could be focused are:

Climate change adaptation (related to the UNFCCC process and beyond):

- Help countries in situations of fragility prepare integrated climate change adaptation plans that reflect the relevant compound risks, starting with a technical report on best practices by the technical bodies under the UNFCCC.
- Ensure access to the Green Climate Fund and other UNFCCC financing mechanisms for countries in situations of fragility.
- Help countries in situations of fragility implement resilience-building initiatives, especially at the local level, by providing technical support and guidance on the pro-peace potential of climate change adaptation.
- Apply a 'do no harm' approach to ensure that adaptation measures in fragile contexts are conflict-sensitive.

Global development and humanitarian processes:

- Ensure that the post-2015 development agenda and the implementation of the new SDGs overcome the sectoral and siloed approaches of the past, including by explicitly cross-referencing the SDGs, the Sendai Framework, and climate change adaptation policies. This could start by exploiting potential synergies when setting up institutions for planning, monitoring, or reporting for the different frameworks:
  - Harmonize national reporting requirements for the different global initiatives on disaster risk reduction, on the SDGs, and in reports to the UNFCCC.
  - Support efforts to promote mutually reinforcing planning approaches for these different initiatives and frameworks.
- Ensure that ODA for countries in fragile situations is less volatile and is more evenly distributed.
- Encourage multilateral institutions, including international financial institutions such as the World Bank, and the sectoral organizations in the UN system to:
  - Increase their focus on climate change and fragility.
  - Conduct integrated climate and fragility risk assessments.
  - Develop corresponding operational guidance for climate-sensitive and conflict-sensitive policies and programmes.

Peacebuilding:

- Improve peace, conflict, and fragility assessments—particularly the fragility assessments of the g7+—to better reflect environmental and climate-related compound risks.
- Strengthen capacities within the UN system with respect to climate-fragility risks; one entry point is the UN Secretariat's capacity to provide crucial contextual information on climate and fragility risks to the UN Security Council.
- Aim to ensure that financing instruments for peacebuilding earmark funds for programmes to address climate and fragility risks, for example, as part of the Peacebuilding Fund and UN multi-donor trust funds.
- Integrate climate change adaptation with peacebuilding programmes to realize potential co-benefits, especially for conflict prevention and disaster risk reduction.

4.4 Recommendation 4: Partner for resilience
Engage a wide range of partners to ensure global actions produce local results

PARTNER FOR RESILIENCE	
Recommendation	**Engage a wide range of partners to ensure that global actions increase local resilience against climate-fragility risks.**
Priorities	• Engage national governments and non-state actors in countries in situations of fragility. • Strengthen the links between initiatives at the international, national, and local levels.
Entry points	• Partner with states that have endorsed the principles of the New Deal for Engagement in Fragile States to better understand and respond to relevant climate-fragility compound risks (e.g., by providing technical training workshops). • Use existing networks, fora, and conferences to foster international discussions on how to build resilience against climate change and fragility. • Engage with thematic networks, such as the Nansen Initiative on Disaster-Induced Cross-Border Displacement. • Advocate with regional organizations, such as the ECOWAS and ASEAN, to make climate change and fragility a key topic on their agendas.

The G7 can also lead the way towards more and better coordination with other countries, local governments, and NGOs. This G7 effort needs to link up with the diverse actors that have shown impressive leadership and action at all levels. To this end, the task force must find ways for the G7 to engage with the governments of countries in situations of fragility and to equally acknowledge the roles of non-state actors. Too often, global initiatives have squandered their potential by assuming that global actions will trickle down to create local results. The task force needs to strengthen the links between different initiatives so that countries, cities, communities, corporations, and civil society can work together and learn from each other. By working with a wide range of partners, the G7 can ensure increased effectiveness in action.

The G7 task force should reach out beyond the G7 itself to governments of countries in fragile situations and, to the degree possible, to local and non-state actors. The best way to do this would be to link to existing networks, fora, and conferences—such as the World Economic Forum; the World Bank's Fragility, Conflict, and Violence Forum; Habitat III; UNFCCC meetings; and the many other consultation processes within the UN system that bring in civil society organizations. These could all be included in the enterprise of fostering a new international discussion on climate change and fragility.

Engaging with thematic networks, such as the Nansen Initiative on Disaster-Induced Cross-Border Displacement, is one way to systematically address the compound risks with a variety of stakeholders. A wide-ranging consultative process with multiple stakeholders involving such networks could help to build a community of practice to address climate change and fragility concerns. In addition, there are multiple entry points at the regional level that are normally neglected by international processes like the UNFCCC. Regional organizations, such as the ECOWAS and ASEAN, can help to make climate change and fragility a key topic on regional policy agendas.

In addition, the G7 task force could work in direct partnership with states that have endorsed the principles of the New Deal for Engagement in Fragile States to improve understanding of and response to relevant climate-fragility risks at the country level by, for example, providing technical training workshops on:

- Including climate risks in their fragility assessments
- Using fragility assessments to inform national adaptation plans
- Responding to environmental indicators and warnings
- Improving risk assessment data and processes

At technical workshops, the G7 countries and states that have endorsed the principles of the New Deal for Engagement in Fragile States could delve more deeply into the technical themes of this report, grounded in a regional and national context. The results from these meetings could be shared with a public audience, and accompanied by a deeper investment in a specific region or country to push forward work on that theme.

4.5 Five action areas: Make progress on five key tasks for building resilience against climate-fragility risks

FIVE ACTION AREAS	
Recommendation	**Make progress on five key tasks for building resilience against climate-fragility risks.**
Priorities	• Improve and make better use of global assessments of climate-fragility risks. • Strengthen food security. • Integrate climate-fragility considerations into disaster risk reduction programmes. • Prepare mechanisms for settling potential transboundary disputes over water. • Make building local resilience a priority goal of overseas development assistance.

4.5.1 Action Area 1: Global risk assessment

At the heart of risk management is risk assessment. A unified, shared, and accessible risk assessment methodology to generate actionable conclusions is needed. A common assessment provides a joint understanding of the risks that can then be translated into actionable conclusions by and for different stakeholders and institutions. We recommend that the G7, through the task force, lead this process.

This methodology will address the compound risks analysed in this report and encompass both climate sensitivity and conflict sensitivity. Assessing climate sensitivity, as we use the term here, requires tracking trends in GHG emissions, the consequent and likely changes in climate, and its impact on different regions and countries. Examples of impact are an increased likelihood of extreme weather events, slow-onset pressures such as droughts, and seasonal changes such as altered timing of the monsoon. Assessing conflict sensitivity requires checking the impact on conflict risk and the fragility of climate changes, along with actions taken to address them.

Governments carry out many different risk assessments that address aspects of these risks. Though many are of high quality, the effort as a whole is disjointed and often not coordinated within governments, let alone between them. Further, these assessments often neglect the links between climate change and fragility and do not generally lend themselves to actionable conclusions.

As a whole, there are four forecasting segments:

1. GHG emissions
2. The climate system's response
3. The knock-on consequences for society, the economy, and politics, and the conflict and fragility risks that arise from them
4. The unintended consequences of actions taken to mitigate any or all of these risks

No government, intergovernmental agency, or research institution currently conducts this kind of integrated analysis of climate change and fragility, though components of it are reasonably familiar. There is considerable evidence and analysis available to help forecast future GHG emission levels, while the work of the climate science community, surveyed by the IPCC's Working Group I and

Working Group II, covers the climate system's response. On the third segment, there has been academic research but little specification of climate-fragility risks, which also hardly figure in national assessments of climate change. The main gap in current knowledge is between the first two segments and the third. As for the fourth segment—the risk of unintended policy and programming effects—there is some concern among the experts, but the issue has a low profile.

A global risk assessment instrument will cover all four segments, taking a whole-system approach to measuring compound risk. It will draw on established knowledge where available, focus on providing new knowledge where necessary, and above all link the different parts into a whole. Fully developed, the aim will be to offer a climate-fragility 'do no harm' test of major initiatives in development aid and trade policies, infrastructure and extractive industry investments, transport, energy, and construction. This test will indicate which possible consequences require close attention and mitigation. With this information, governments could systematically work to minimize the chances that climate responses would contribute to conflict and fragility while actively capturing co-benefits for climate adaptation, humanitarian assistance, peacebuilding and conflict resolution, and the broader socio-economic development agenda. The assessment process would thus become a transmission mechanism through which high-level concerns and goals would become ground-level realities.

However, experiences with existing risk assessments clearly show that the problem is not only making good and timely information available but also figuring out how to use it. The improved internal coordination that we recommend for G7 governments should make it more likely that the right kind of information can find landing points. The emphasis we place on an assessment that is directed at producing actionable conclusions should make it more likely that the right kind of information is available. And the commitment to integrated responses to compound climate and fragility risks that we hope the G7 will make in response to this report should provide the political momentum that is required for the whole arrangement to work.

The first steps would include:

- Develop a unified, shared, and accessible risk methodology covering all segments of the problem and directed towards producing actionable conclusions.
- Formulate a 'do no harm' test of major initiatives in development policies, trade, and related fields, to ensure consistency of policy and practice.
- Communicate the conclusions of the compound risk assessment to the parts of government that are appropriately equipped to absorb and act on them.

4.5.2 Action Area 2: Food security

Insecure food supplies and volatile food prices are major factors in insecurity, instability, and fragility. They are often related to significant deficiencies in food policy and are now being exacerbated by the impacts of climate change. This is a priority area for action. The G7 governments can focus on improving food security, which will simultaneously meet urgent needs, reduce fragility, and prevent future conflict.

The risk analysis in this report highlights the need to understand the intersection between climate-related food insecurity and the economic and social grievances, marginalization, and politics that generate insecurity. In a country marked by existing poverty, poor governance, and fragility, food insecurity can be explosive. Climate variability in that country and in major food-growing countries increases the pressure.

To improve food security, we recommend five steps:

- Strengthen access to timely and accurate data and analysis to provide policymakers with a solid evidence base for policy decisions. Our policy analysis identified gaps in the access and analysis of timely and accurate data at the international level. The G7 governments can support and facilitate more comprehensive risk assessments to this end.
- Limit critical food price fluctuations by improving access to markets, reducing trade barriers, and enhancing market information.
- Ensure that, if food prices fluctuate to potentially critical degrees, markets are open and trade barriers are limited to ensure adequate, predictable, and affordable access to food. We recommend exploring a broad range of options, such as improving the availability of information on food supply and demand through international dialogue, discouraging food hoarding by countries, and considering the case for establishing regional food reserves.
- During food price crises, keep the market operating both internationally and domestically. Hoarding, panic buying, special tariffs, export bans or controls, and surcharges all distort markets and worsen crises.
- For longer-term resilience, build on established strategies that promote the use of local supplies and boost local markets, including cross-border trading. The G7 governments can use their political influence to persuade their counterparts across the world of the benefits of free and open markets and seek to commit them to the attendant strategies.

In the longer term, one condition for improving food security is to improve food policies. This is a long-term development task that belongs to national governments. The developed countries' aid policies can help by focusing on building the resilience of food systems in countries in situations of fragility, as we outline in the fifth action area below.

4.5.3 Action Area 3: Disaster risk reduction

The global humanitarian workload has increased and will likely continue to grow, along with the impacts of climate change and climate-fragility risks. In many low-income countries, humanitarian crises are a basic challenge to development. The lives, livelihoods, assets, and investments that are lost to disasters and conflict and the costs of disaster responses, compensation, and rebuilding constitute a heavy burden. Failure to satisfy humanitarian needs can spur resentment and exacerbate grievances, while the flood of resources into a disaster-hit country can unwittingly become the focal point of conflict and crime.

We must manage the risk rather than the crisis, and we must sustain this effort by making adequate and flexible human, natural, financial, and legal resources available for disaster risk reduction. We need a development strategy that prepares for shocks, and we need a humanitarian strategy that complements development.

To this end, integrating disaster risk reduction, peacebuilding, and climate change adaptation into support for developing countries should be an explicit foreign policy goal of the G7 governments. The implementation of the newly adopted Sendai declaration and framework and of a new global climate agreement should be aligned with each other in order to realize synergies and avoid duplication of effort. The work of strengthening national disaster risk reduction efforts could be more closely integrated into development policy and activities to eliminate duplication and maximize gains. Governments facing these challenges may find value in shaping their development strategies to build their capacities to successfully manage disasters and the risks of climate-related insecurity.

Many states will continue to require external support to complement domestic efforts to prevent and address humanitarian crisis. But rather than continuing the current pattern of expenditures spiking as crises erupt and falling when they pass, development partners should work together to invest in crisis prevention. This effort includes continuously monitoring risks and trends (including capacities and vulnerability) and developing thresholds for action. These early actions respond to the cumulative impact of risks before they result in a disaster, strengthening coping capacities and reducing vulnerabilities. Over the long term, investment in these areas will save lives and cost less. If these fail, humanitarian response—a much more expensive mechanism—will kick in.

This effort requires that global information be translated for local use and, conversely, that local information be included in worldwide risk monitoring and assessments. Technology-based monitoring and early warning can be enhanced by crowd-sourcing and social media. By partnering with the private sector, and in particular with regional telecommunications and mobile network providers, foreign policymakers can ensure that effective monitoring networks link directly with decision-making.

The existing international architecture of disaster risk reduction is well developed. Supported by adequate and flexible resources, working in partnership with the private sector, its positive impacts could be further enhanced by linking existing structures even more closely to comprehensive risk assessment and integrated strategies for development; for example:

- The G7 could partner with existing organizations, such as the World Bank or regional development banks, to help institutions develop operational guidance and lessons learned for climate-sensitive and conflict-sensitive planning, design, and implementation of disaster risk reduction policies and programs.
- The G7 could call on existing sectoral organizations, such as the UN Office for Disaster Risk Reduction, to integrate climate-fragility considerations into their work.

4.5.4 Action Area 4: Transboundary water disputes settlement

Improving water management will become increasingly urgent as pressures multiply and climate variability disrupts the conditions underlying water-sharing agreements. While this situation is true at all levels of governance, it is particularly significant for transboundary river basins, due to the potential foreign policy consequences of interstate conflict over shared waters. In many of these basins, developmental pressures are driving hydropower and large-scale irrigation projects that have potentially significant effects on downstream neighbours. Mechanisms for cooperative management need to be both robust and flexible, so that they can not only withstand political challenges and hydrological changes but also be periodically revisited to reassess needs and optimize benefits. Better coordination with key climate adaptation processes can ensure that climate change forecasts inform cooperation on transboundary waters.

The countries in transboundary basins hold the primary responsibility for improving cooperation and stand to gain the most from it. Yet because perceived political risks may prevent the basin members from realizing the benefits of cooperation, outside engagement may be helpful. The members of the G7 have significant experience in supporting riparian-led efforts to cooperate in transboundary water management. This experience could serve as a starting point for more systematic foreign policy engagement that establishes and reinforces risk management and conflict resolution arrangements before scarcity and variability make the transition from visible issues to acute problems.

The underlying strategy would have three pillars:

- Strengthen existing local and national institutions and mechanisms for water management — especially shared resources — in affected countries and regions. Better water management will help achieve other important development goals, such as improving health, which will in turn contribute to resilience. This capacity-building effort can seek to not only improve technical water management but also water governance, which could head off potential disputes before they pose significant problems. One specific entry point is building capacity for establishing or strengthening regional mechanisms for data transparency, including joint data collection and assessment, and ultimately for collaboratively developing joint responses.
- Improve knowledge management. Existing legal arrangements may provide useful guidelines for approaching conflicts over shared water resources. Moreover, supporting joint vulnerability assessments in transboundary basins could help build a shared understanding of future challenges. The G7 governments could give greater support to the dissemination of good examples, practices, and lessons learned.
- Build on existing efforts to foster cooperation between governments in transboundary river basins where water is, or could become, a source of tension. Although significant water diplomacy efforts are already under way, they could become more systematic and better coordinated. To this end:
  - The G7 governments could convene a global conference on transboundary basins, with a view to assessing how existing frameworks could be amended to secure greater buy-in from important external actors as well as basin countries. Such frameworks should ensure that transboundary water management is systematically linked to climate adaptation and resilience. They should also help mobilize external funding and private infrastructure investment and support the coordination of investments across the basin to strengthen overall resilience and mutual trust.
  - One particular entry point could be to support river basin organizations in gaining access to the Green Climate Fund. This could simultaneously strengthen reporting and action on regional aspects of climate change, help build contacts and practices of cooperation as well as joint responses to shared challenges, and strengthen the position of these organizations through their access to additional funding.

4.5.5 Action Area 5: Building local resilience

The G7 governments can embed support for community resilience throughout their aid programmes and use their influence in donor forums to encourage others to do the same, including new ODA donors.

Adaptation to climate change and resilience to a range of different threats — disasters, slow-onset pressures, and economic shocks — are built through a plethora of small-scale actions. They consistently depend on local commitment and local energy, whether in a company, community, or even a family. The local component, however, while necessary, is neither sufficient nor infallible; national leadership, responsive to local needs but also reflecting the bigger picture, is also essential.

Accordingly, it is essential to engage both local communities and government authorities in building resilience. Local actions require coordination and support in the form of training, equipment, information, and infrastructure, as well as support and direction from national governments, and sometimes coordination with neighbouring governments. In situations of fragility and in other low-income countries, they require international financial support.

The G7 task force should help ensure that there is a consistent policy direction in overseas development cooperation, so that ODA programmes in fragile contexts deploy an integrated overall approach to support national and local efforts to build resilience, by coordinating adaptation, development, humanitarian, and peacebuilding efforts. To this end, ODA should emphasise the following priorities:

- Help regional organizations, national governments, city and provincial authorities, and local communities develop their knowledge base for understanding climate-fragility risks and deciding how to address them, by:
  - Providing information on risks, their sources, and the kinds of pressures the community may face.
  - Helping explore the range of traditional and modern methods that can be called on to mitigate and / or manage risk.
  - Advising on available assistance.

- Focus support for improving food security, by:
  - Investing in research and development, sustainable irrigation, and rural infrastructure to build resilience of the food system in the face of extreme weather events and slow-onset pressures such as droughts.
  - Strengthening social protection systems for the poor.

- Provide technical expertise and training on new practices, such as:
  - Climate-smart agriculture (e.g., new crop cycles and new crops)
  - Climate-smart infrastructure (e.g., new building regulations to withstand disasters or to avoid using too much water)
  - Improved water, energy, and ecosystem management systems
  - Gathering data on changing climates and unfolding risks

- Understand the needs of different groups and seek cooperative solutions, such as:
  - Safe corridors for herders (safe for them, safe for farmland)
  - Safeguarding land use and tenure where documentation is lacking
  - Forums for discussing changing local weather conditions
  - Forums for discussing changing social conditions, such as the arrival of migrants from drought areas
  - Village committees discuss and decide water use
  - Community forums on new buildings and infrastructure
  - A village-level flood early warning system

4.6 A new commitment: The foundation for a more peaceful and more resilient future

These recommendations will only be effective in tandem with joint efforts to reduce the emission of GHGs. But even with an ambitious emissions agreement, climate-fragility risks will persist, so the preventive response must continue.

Responding to the global strategic threat posed by climate change is too great a task for any single government. This diverse set of recommendations outlines direct opportunities for the G7 member states, as well as for the G7 as a group, in coordination with their international partners, to confront climate-fragility risks with integrated responses. Over time, the G7 governments and their partners may find that more explicit collaboration and more formal coordination through new arrangements and institutional structures could enable them to better capture synergies and achieve greater impact.

Climate impacts know no bounds. They cross all boundaries, whether of nation, sector, or agency. The G7 does not alone bear the responsibility to act on climate change and climate-fragility risks. But this year, the G7 countries have a singular opportunity to demonstrate their commitment to tackling the challenges of climate change. The G7 foreign ministers can begin by articulating and acting on a new commitment to respond to one of the great challenges of our time: building resilience to climate-fragility risks.

List of Abbreviations

ADB	Asian Development Bank
ADF	African Development Fund
AfDB	African Development Bank
AsDF	Asian Development Fund
ASEAN	Association of Southeast Asian Nations
BECCS	bioenergy with carbon capture and storage
CDB	Caribbean Development Bank
CNA	Center for Naval Analysis
CSA	climate-smart agriculture
DFID	Department for International Development (UK)
DRC	Democratic Republic of the Congo
DRR	Disaster Risk Reduction
ECHO	European Commission's Humanitarian Aid and Civil Protection Department
ECOWAS	Economic Community of West African States
EEA	European Environment Agency
ENVSEC	Environment and Security Initiative
EPLO	European Peacebuilding Liaison Office
FAO	Food and Agriculture Organisation of the United Nations
FCO	Foreign and Commonwealth Office
GCCA	Global Climate Change Alliance
GCF	Green Climate Fund
GDP	gross domestic product
GEF	Global Environmental Facility
GHG	greenhouse gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (formerly Deutsche Gesellschaft für Technische Zusammenarbeit, GTZ)
IBRD	International Bank for Reconstruction and Development (World Bank)
IcSP	Instrument contributing to Stability and Peace
IDA	International Development Association (World Bank)
IDB	Inter-American Development Bank
IEA	International Energy Agency
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute

INFORM	Index for Risk Management
IPCC	Intergovernmental Panel on Climate Change
LDC	least developed country
LDCF	Least Developed Countries Fund
MDTFs	multi-donor trust funds
MoD	Ministry of Defence (UK)
NAP	national adaptation plan
NAPA	national adaptation programmes of action
NGO	non-governmental organization
OCHA	Office for the Coordination of Humanitarian Affairs (UN)
OCR	official change rate
ODA	official development assistance
ODI	Overseas Development Institute
OECD	Organisation for Economic Co-operation and Development
OECD-DAC	OECD Development Assistance Committee
PSGs	Peacebuilding and Statebuilding Goals
REDD	Reducing Emissions from Deforestation and Forest Degradation
SCCF	Special Climate Change Fund
SDGs	Sustainable Development Goals
UN-DESA	United Nations Department for Economic and Social Affairs
UN Habitat	United Nations Human Settlements Programme
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
UNISDR	United Nations Office for Disaster Risk Reduction
UNODC	United Nations Office on Drugs and Crime
USAID	US Agency for International Development
WFP	World Food Programme
XCF	Extreme Climate Facility

Glossary

ABSORPTIVE CAPACITY

The 'ability of a country or organization to receive aid and use it effectively' (*European Union 2015*). If this capacity is overwhelmed by large flows of external resources, aid may not be effective in achieving its intended results (*Renzio 2007*).

ADAPTATION

The 'adjustment of natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Adaptation is a process and not an outcome' (*GIZ and WRI 2011*).

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' (*Parry et al. 2007*). It is used to describe the various socio-economic, structural, institutional, and technological abilities of a human system to produce adaptation measures (*Fritzsche et al. 2014*).

AUTHORITY (STATE)

The 'power or dominion that is seen as legitimate by those subject to it' (*OECD 2010*), thus constituting the basis for non-coercive rule. It also includes the ability of a state to provide basic security to its citizens within its borders.

CAPACITY (STATE)

State capacity 'encompasses (a) organisational, institutional and financial capacity to carry out basic functions of governing a population and territory, and (b) the state's ability to develop mutually constructive and reinforcing relations with society' (*OECD 2010, 15*).

CLIMATE CHANGE

The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as 'a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods' (*United Nations 1992, 3*).

COLLAPSED STATE

'Collapsed' and 'failed' are often used interchangeably to describe a state that has entirely ceased to function (*Mcloughlin 2012*). See also 'failed state'.

COMPOUND CLIMATE–FRAGILITY RISKS

These are risks that emerge as climate change interacts with other pressures on states and societies. They include local resource competition, livelihood insecurity and migration, extreme weather events and disasters, volatile food prices and provision, transboundary water management, sea-level rise and coastal degradation, and unintended effects of climate policies.

CONFLICT

A 'relationship among two or more parties, whether marked by violence or not, based on actual or perceived differences in needs, interests and goals' (*Means et al. 2002, 9*). Conflict is a normal part of societies and an important force for social

change. However, if conflict escalates, it can develop into a negative force, destroying human life, the environment, and social relations.

CONFLICT SENSITIVITY

Policies and programmes that are conflict sensitive seek to avoid a relapse into violent conflict or to aggravate an existing conflict. In the context of development cooperation, this principle is called 'do no harm'. Conflict sensitivity is normally a minimum standard for any intervention in a conflict environment (*Rüttinger et al. 2014*).

CRISIS

A situation of acute instability with increased levels of violent conflict, the potential for a relapse into more generalized violent conflict, or one or more disasters (*g7+ 2013*).

DISASTER

A severe disruption of the 'functioning of a community or a society due to hazardous physical events interacting with vulnerable social conditions, leading to widespread adverse human, material, economic, or environmental effects that require immediate emergency response to satisfy critical human needs and that may require external support for recovery' (*Lavell et al. 2012, 31*).

DISASTER RISK REDUCTION

The 'concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters', including reducing exposure to hazards, lessening the vulnerability of people and property, managing land and the environment wisely, and improving preparedness for adverse events (*UNISDR 2015*).

DO NO HARM

The minimum obligation that any action or intervention in climate adaptation, development, humanitarian aid, and peacebuilding 'consciously looks for and seeks to avoid or mitigate negative impacts' (*interpeace 2010*).

EXTREME WEATHER EVENT

Extreme events are a facet of climate variability under stable or changing climate conditions. They are defined as the occurrence of a value of a weather or climate variable above (or below) a threshold value near the upper (or lower) ends of the range of observed values of the variable. Extreme events are often but not always associated with disaster (*Lavell et al. 2012*).

FAILED STATE

'A failed state is marked by the collapse of central government authority to impose order, resulting in loss of physical control of territory, and/or the monopoly over the legitimate use of force. Crucially, it can no longer reproduce the conditions for its own existence' (*Mcloughlin 2012*).

FAILING STATES

Often used to describe 'states that are substantially failing their citizens and/or are failing to achieve economic growth', this terminology is contentious, since it can be both applied to states that are failing and those that are at risk of failing, and thus it does not account for the fact that some states can be failing in some respects but not others (*Mcloughlin 2012*).

FRAGILITY

The inability (whether whole or partial) of a state to fulfil its responsibilities as a sovereign entity, including a lack of legitimacy, authority, and capacity to provide basic services and protect its citizens (*Carment et al. 2007; Teskey et al. 2012; Stepputat and Engberg-Pedersen 2008*).

GREY WATER

Domestic wastewater that is produced in 'homes and commercial buildings through the use of water for laundry, dishes, or for bathing' (*ecolife 2011*). Grey water is different from black water, which has a higher degree of organic loading and is used in toilets and discharged into the sewage system.

HAZARD

'A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage' (*UNISDR 2015*).

HUMAN SECURITY

The broad and people-centered concept of human security is defined as 'safety from such chronic threats as hunger, disease, and repression, . . . and protection from sudden and hurtful disruptions in the patterns of daily life' (*UNDP 1994*). Human security has seven dimensions: economic, food, health, environmental, personal, community, and political.

LEGITIMACY

A government, actor, or institution that is perceived as satisfactory and the best available alternative to fulfill the population's needs and expectations is legitimate. Legitimacy can be derived both from the performance of the state in terms of the quality and equity of service delivery (output legitimacy) and by a set of agreed rules and accountability mechanisms, such as participation and good governance (input legitimacy). Legitimacy is also the basis for rule by non-coercive means (*Bellina et al. 2009*).

MAINSTREAMING (CLIMATE ADAPTATION)

Integrating climate change adaptation into policymaking, budgeting, and implementation processes of another policy field, such as development and humanitarian assistance, at the national, sectoral, and sub-national levels (*UNDP-UNEP 2011*).

MITIGATION

A human intervention that decreases the sources or increases the sinks of GHGs and other substances which may contribute directly or indirectly to climate change (*IPCC 2014*).

POCKETS OF FRAGILITY

Localized situations of fragility in otherwise stable states. Pockets emerge, for example, when a state abdicates its responsibility for a particular group (often poor or marginalized) or loses its control over a region of the country, leaving a power vacuum to be filled by criminal gangs or insurgent militias.

RESILIENCE

The positive counterpart of fragility. A resilient state or society is characterized by the ability to cope with increasingly complex, uncertain situations and to 'manage and adapt to changing social needs and expectations', including the complex challenges arising from the interaction of climate change with other pressures. Resilience also includes the 'ability to absorb and recover from shocks, whilst positively adapting and transforming their structures and means for living in the face of long-term changes and uncertainty' (*OECD 2011*).

RISK

The 'potential for an unwanted outcome … as determined by its likelihood and the associated consequences' (*US Department of Homeland Security 2008, 24*). Climate risks, in particular, are 'not solely externally generated circumstances or changes in the climate system to which societies respond, but rather the result of complex interactions among societies or communities, ecosystems, and hazards arising from climate change' (*IPCC 2014, 1050*).

SITUATIONS OF FRAGILITY

In a situation of fragility, the state lacks basic governance functions and the ability to develop mutually constructive relations with society. It can neither fulfil its functions, nor is it perceived as legitimate. Situations of fragility range from crisis, such as large-scale conflict, to transitional stages, such as post-conflict situations and regime change.

THREAT

A direct or indirect threat to the security of a country, society or individual. 'Threats do not unambiguously speak for themselves. Understanding the meaning of threats is mediated by the perception of the target' (*Gross Stein 2013*).

THREAT MULTIPLIER

Climate change is often viewed as a threat multiplier that exacerbates existing fragility and conflict risks (*European Commission 2008; CNA 2014*).

VULNERABILITY

The 'degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity' (*IPCC 2007b; Parry et al. 2007*). Vulnerability is dynamic and context-specific. It can be influenced by human behavior and societal organization; for example, the marginalization of certain groups often decreases their adaptive capacities (*IPCC 2014*).

WEAK STATE

Weak states suffer from significant shortcomings in the areas of security, performance, and legitimacy. This often means that they lack control over certain areas of their territory. Experts criticize this term as inherently contradictory and misleading. The occurrence of pockets of fragility in high-capacity and functioning states is an example of the limits of this term (*Mcloughlin 2012*).

Bibliography

Abulof, Uriel 2015: 'Can't buy me legitimacy': the elusive stability of Mideast rentier regimes. In: Journal of International Relations and Development advance online publication: February 20, pp 1–25.

ACF 2011: Disaster risk management for insecure contexts. Paris: Action Contre la Faim (ACF).

Adaptation Committee 2013: The state of adaptation under the United Nations Framework Convention on Climate Change. Bonn: United Nations Framework Convention on Climate Change.

Adaptation Committee 2014: Institutional arrangements for national adaptation planning and implementation. Bonn: United Nations Framework Convention on Climate Change.

Adaptation Fund 2014: Funded projects. Retrieved 16 Mar 2015, from *https://www.adaptation-fund.org/funded_projects*.

ADB 2010: Asian Development Bank's support to fragile and conflict-affected situations. Manila: Asian Development Bank (ADB).

ADB 2012: Working differently in fragile and conflict-affected situations.The ADB experience. Manila: ADB.

ADB 2014: Statement of the Asian Development Bank's operations in 2013. Retrieved 21 Dec 2014, from *http://www.adb.org/sites/default/files/institutional-document/34106/files/statement-adb-operations-2013.pdf*.

Adger, W. Neil; Juan M. Pulhin; Jon Barnett; Geoffrey D. Dabelko; Grete K. Hovelsrud; Marc Levy; Úrsula Oswald Spring and Coleen Vogel 2014: Human security. In: IPCC (ed.): Climate change 2014: impacts, adaptation, and vulnerability - part A: global and sectoral aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge and New York: Cambridge University Press.

AfDB 2011: The cost of adaptation to climate change in Africa. Retrieved 08 Apr 2015, from *http://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Cost%20of%20Adaptation%20in%20Africa.pdf*.

AfDB 2014a: Addressing fragility and building resilience in Africa: the African Development Bank Group strategy 2014–2019. Retrieved 26 Mar 2015, from *http://www.afdb.org/fileadmin/uploads/afdb/Documents/Policy-Documents/Addressing_Fragility_and_Building_Resilience_in_Africa-_The_AfDB_Group_Strategy_2014%E2%80%932019.pdf*.

AfDB 2014b: From fragility to resilience: managing natural resources in fragile states in Africa. Tunis: African Development Bank Group.

AfDB 2014c: AfDB statistics – pocketbook. Retrieved 6 Dec 2014, from *http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/AfDB_Statistics_Pocket_Book_2014.pdf*.

African Risk Capacity 2015: Extreme Climate Facility (XCF). Retrieved 08 Apr 2015, from *http://www.africanriskcapacity.org/documents/350251/757534/African+Risk+Capacity+Fact+Sheet.pdf*.

Al-Ansari, Nadhir; N. Alibrahiem; M. Alsaman and Sven Knutsson 2014: Water supply network losses in Jordan. In: Journal of Water Resources and Protection 6:1, pp 83–96.

Alden Wily, Liz 2009: Tackling land tenure in the emergency to development transition in post-conflict states: from restitution to reform. In: Pantuliano, Sara (ed.): Uncharted territory: land, conflict and humanitarian action. Rugby: Practical Action Publishing.

Aldrich, Daniel P. 2013: The role of governmental capacity and citizens' input in disaster management. Seoul: East Asian Institute (EAI).

Alexander, Rajan 2006: Tsunami: build back better. Mantra aside, an aid gone wrong story? Bangalore: Development Consultancy Group.

Alkire, Sabina; José Manuel Roche; Maria Emma Santos and Suman Seth 2011: Multidimensional poverty index 2011. Oxford: Oxford Poverty & Human Development Initiative (OPHI).

Andrews, Matt; Lant Pritchett and Michael Woolcock 2012: Escaping capability traps through problem-driven iterative adaptation (PDIA). Retrieved 26 Mar 2015, from *http://www.cgdev.org/files/1426292_file_Andrews_Pritchett_Woolcock_traps_FINAL.pdf*.

Arowosegbe, Jeremiah O. 2009: Violence and national development in Nigeria: the political economy of youth restiveness in the Niger Delta. In: Review of African Political Economy 36:122, pp 575–594.

Ayeb, Habib and Ray Bush 2014: Small farmer uprisings and rural neglect in Egypt and Tunisia. In: Middle East Report, Middle East Research and Information Project 272:44, pp n.a.

Bakrania, Shivit 2013: Conflict drivers, international responses, and the outlook for peace in Mali: a literature review. Birmingham: Governance and Social Development Resource Centre; University of Birmingham.

Barakat, Sultan; Kathryn Rzeszut and Nick Martin 2012: What is the track record of multi donor trust funds in improving aid effectiveness? An assessment of the available evidence. Retrieved 08 Apr 2015, from *http://r4d.dfid.gov.uk/pdf/outputs/systematicreviews/Q48_Multidonor_trust_fund_2012Barakat(2)FINAL.pdf*.

Barnett, Jon and Saffron O'Neill 2010: Maladaptation editorial. In: Global Environmental Change 20:2, pp 211–213.

Batmanglich, Sara and Monica Stephen 2011: Peacebuilding, the World Bank and the United Nations: debates and practice in Burundi, Liberia and Nepal. London: International Alert.

Bauer, Steffen; Ines Dombrowsky and Imme Scholz 2014: Post 2015: enter the UN General Assembly: harnessing Sustainable Development Goals for an ambitious global development agenda. Bonn: German Development Institute.

Bayat-Renoux, Fiona and Yannick Glemarec 2014: Financing recovery for resilience: Enhancing the coverage, capitalization and coherence of pooled financing mechanisms for recovery to strengthen synergies between humanitarian, development and climate finance. New York: UNDP MPTF Office.

Beehner, Lionel 2007: The effects of 'youth bulge' on civil conflicts. Retrieved 09 Dec 2014, from *http://www.cfr.org/world/effects-youth-bulge-civil-conflicts/p13093*.

Bellina, Séverine; Dominique Darbon; Stein Sundstol Eriksen and Jacob Ole Sending 2009: The legitimacy of the state in fragile situations. Oslo: Norad/ French Ministry of Foreign and European Affairs.

Benjaminsen, Tor A. 2008: Does supply-induced scarcity drive violent conflicts in the African Sahel? The case of the Tuareg rebellion in Northern Mali. In: Journal of Peace Research 45:6, pp 819–836.

Bennett, Jon; Sara Pantuliano; Wendy Fenton; Anthony Vaux; Chris Barnett and Emery Brusset 2010: Aiding the peace: a multi-donor evaluation of support to conflict prevention and peacebuilding activities in southern Sudan 2005–2010. London: ITAD Ltd.

Berazneva, Julia and David R. Lee 2013: Explaining the African food riots of 2007–2008: an empirical analysis. In: Food Policy 39:1, pp 28–39.

Bettencourt, Luis; José Lobo; Dirk Helbing; Christian Kühnert and Geoffrey West 2007: Growth, innovation, scaling, and the pace of life in cities. In: Proceedings of the National Academy of Sciences of the United States of America 104:17, pp 7301–7306.

Bhattacharya, Sanjukta and Arup Poddar 2012: Final order of the Cauvery River - a review report. Retrieved 18 Feb 2015, from *http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2008550*.

Black, Richard; W. Neil Adger; Nigel W. Arnell; Stefan Dercon; Andrew Geddes and David Thomas 2011: The effect of environmental change on human migration. In: Global Environmental Change 21, Supplement 1:0, pp S3–S11.

Bob, Urmilla und Salomé Bronkhorst (eds.) 2014: Conflict-sensitive adaptation to climate change in Africa. Berlin: Berliner Wissenschaftsverlag.

Boelens, Rutgerd; Armando Guevara-Gil and Aldo Panfichi 2010: Indigenous water rights in the Andes: struggles over resources and legitimacy. In: The Journal Of Water Law 20:5, pp 268–277.

Boersma, Tim and Kevin Foley 2014: The Greenland gold rush: promise and pitfalls of Greenland's energy and mineral resources. Washington, DC: Brookings Institution.

Bonds, Eric and Liam Downey 2012: 'Green' technology and ecologically unequal exchange: the environmental and social consequences of ecological modernization in the world. In: Journal of World-Systems Research 18:2, pp 167–186.

Boyce, J. K. and S. Forman 2010: Financing peace: international and national resources for postconflict countries and fragile states. Background paper for the World Development Report 2011. Washington, DC: World Bank.

Brecht, Henrike; Susmita Dasgupta; Benoit Laplante; Siobhan Murray and David Wheeler 2012: Sea-level rise and storm surges: high stakes for a small number of developing countries. In: The Journal of Environment & Development 21:1, pp 120–138.

Breisinger, Clemens; Olivier Ecker; Perrihan Al-Riffai and Bingxin Yu 2012: Beyond the Arab awakening: policies and investments for poverty reduction and food security. Washington, DC: IFPRI.

Brinkman, Henk-Jan and Cullen S. Hendrix 2011: Food insecurity and violent conflict: causes, consequences and addressing the challenges. Rome: WFP.

Bromwich, Brendan 2008: Environmental degradation and conflict in Darfur: implications for peace and recovery. In: Humanitarian Exchange Magazine 39:1, pp 22–29.

Bromwich, Brendan; Abuelgasim Abdalla Adam; Abduljabbar Abdulla Fadul; Florence Chege; Jim Sweet; Victor Tanner and Geoff Wright 2007: Darfur: relief in a vulnerable environment. Teddington: Tearfund.

Brookings Institution 2014: Middle East youth. Retrieved 11 Feb 2015, from *http://www.brookings.edu/research/topics/middle-east-youth*.

Brown, Oli and Alec Crawford 2009: Rising temperatures, rising tensions - climate change and the risk of violent conflict in the Middle East. Winnipeg: International Institute for Sustainable Development.

Brown, Oli and Alec Crawford 2012: Conservation and peace-building in Sierra Leone. Winnipeg: International Institute for Sustainable Development.

Bündnis Entwicklung Hilft 2011: World risk report 2011. Bonn: Bündnis Entwicklung Hilft and UNU-EHS.

Bunting, Madeleine 2011: How land grabs in Africa could herald a new dystopian age of hunger. Retrieved 17 Nov 2014, from *http://www.theguardian.com/global-development/poverty-matters/2011/jan/28/africa-land-grabs-food-security?INTCMP=SRCH*.

Butzengeiger, Sonja and Britta Horstmann 2004: Sea-level rise in Bangladesh and the Netherlands: one phenomenon, many consequences. Bonn: Germanwatch.

Caribbean Development Bank 2014: Annual report 2013 – volume I. Retrieved 21 Dec 2014, from *http://www.caribank.org/uploads/2014/05/2013-CDB-Annual-Report-Vol1.pdf*.

Carius, Alexander; Dennis Tänzler and Achim Maas 2008: Climate change and security - challenges for German development cooperation. Eschborn: Gesellschaft für Internationale Zusammenarbeit (GIZ).

Carment, David; Yiagadeesen Samy and Stewart Prest 2007: Assessing fragility: theory, evidence and policy. In: Politorbis 42:1, pp 13–19.

Casey, Kevin 2014: Greenland's new frontier: oil and gas licenses issued, though development likely years off. Retrieved 09 Jan 2015, from *http://www.thearcticinstitute.org/2014/01/greenlands-new-frontier-oil-and-gas.html*.

Castles, S. 2000: Migration as a factor in social transformation in East Asia. Paper presented at a Conference on Migration and Development. Princeton: Princeton University.

CECORE; REDROC; Saferworld and YODEO 2008: Water and conflict: making water delivery conflict-sensitive in Uganda. Kampala and London: Center for Conflict Resolution (CECORE); Rwenzori Development and Research Center (REDROC); Saferworld; Youth Development Organization (YoDEO).

Chant, Sylvia 2008: The 'feminisation of poverty' and the 'feminisation' of anti-poverty programmes: room for revision? In: Journal of Development Studies 44:2, pp 165–197.

Châtel, Francesca de 2014: The role of drought and climate change in the Syrian uprising: untangling the triggers of the revolution. In: Middle Eastern Studies 50:4, pp 521–535.

Christian Aid 2006: Life on the edge of climate change: the plight of pastoralists in Northern Kenya. Retrieved 27 Jun 2011, from *http://reliefweb.int/sites/reliefweb.int/files/resources/87732D4D8913559C85257225006E7909-christianaid-ken-13nov.pdf*.

Cincotta, Richard 2011: Minority youth bulges and the future of intrastate conflict. Retrieved 10 Dec 2014, from *http://www.newsecuritybeat.org/2011/10/minority-youth-bulges-and-the-future-of-intrastate-conflict/*.

Cincotta, Richard 2012: Population aging: a demographic and geographic overview. Retrieved 10 Dec 2014, from *http://www.newsecuritybeat.org/2012/08/population-aging-a-demographic-and-geographic-overview/*.

Climate Smart Agriculture Concerns 2014: Corporate-smart greenwash: why we reject the Global Alliance on Climate-Smart Agriculture. Retrieved 10 Dec 2014, from *http://www.climatesmartagconcerns.info/rejection-letter.html*.

CNA 2007: National security and the threat of climate change. Alexandria, VA: Center for Naval Analysis.

CNA 2014: National security and the accelerating risks of climate change. Alexandria, VA: CNA Corporation.

Coffey International Development 2012: Darfur community peace and stability fund impact assessment. Final report. London: Department for International Development (DFID).

Collier, Paul; Anke Hoeffler and Dominic Rohner 2009: Beyond greed and grievance: feasibility and civil war. In: Oxford Economic Papers 61:1, pp 1–27.

Commission on Sustainable Agriculture and Climate Change 2012: Achieving food security in the face of climate change. Final report from the Commission on Sustainable Agriculture and Climate Change. Retrieved 09 Apr 2015, from *www.ccafs.cgiar.org/commission*.

Cotula, Lorenzo and James Mayers 2009: Tenure in REDD: start-point or afterthought? London: International Institute for Environment and Development (IIED).

Dabelko, Geoffrey D.; Lauren Herzer; Schuyler Null; Meaghan Parker and Russell Sticklor (eds.) 2013: Backdraft: the conflict potential of climate change adaptation and mitigation. Washington, DC: Woodrow Wilson International Center for Scholars.

Dapice, David 2011: The looming food crisis: extreme weather, economic forces of rising demand and speculation threaten global food security. Retrieved 15 Dec 2014, from *http://yaleglobal.yale.edu/content/looming-food-crisis*.

Darfur Community Peace and Stability Fund (DCPSF) 2012: DCPSF annual report 2012. Retrieved 08 Apr 2015, from *http://mptf.undp.org/document/download/11768*.

Dasgupta, P.; J. F. Morton; D. Dodman; B. Karapinar; F. Meza; M. G. Rivera-Ferre; A. Toure Sarr and K. E. Vincent 2014: 2014: Rural areas. In: Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir (IPCC) (eds.): Climate change 2014: impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge and New York: Cambridge University Press.

Davis, Laura 2014: Supporting peaceful social, political and cultural economic change in Mali. Retrieved 08 Apr 2015, from *http://www.international-alert.org/sites/default/files/Mali_SupportingPeacefulChange_EN_2014.pdf*.

Deheza, Elizabeth and Jorge Mora 2013: Climate change, migration and security: best-practice policy and operations for Mexico. London: Royal United Services Institute (RUSI).

Deininger, Klaus W. and Derek Byerlee 2011: Rising global interest in farmland: can it yield sustainable and equitable benefits? Washington, DC: World Bank.

den Boer, Andrea and Valerie Hudson 2014: The security risks of China's abnormal demographics.Retrieved 07 Jan 2015, from *http://www.washingtonpost.com/blogs/monkey-cage/wp/2014/04/30/the-security-risks-of-chinas-abnormal-demographics/*.

DFID 2011a: Defining disaster resilience: a DFID approach paper. London: DFID.

DFID 2011b: Humanitarian emergency response review. UK government response. London: DFID.

DFID; FCO and MoD 2011: Building stability overseas strategy. London: DFID; FCO; MoD.

Di Leva, Charles and Sachiko Morita 2008: Maritime rights of coastal states and climate change: should states adapt to submerged boundaries? Washington, DC: World Bank.

Di Nunzio, Jack 2013: Conflict on the Nile: the future of transboundary water disputes over the world's longest river. Dalkeith: Future Directions International.

Dobbs, Richard; Jaana Remes; James Manyika; Charles Roxburgh; Sven Smit and Fabian Schaer 2012: Urban world: cities and the rise of the consuming class. Seoul, San Francisco, London and Washington, DC: McKinsey Global Institute.

Eaton, David 2008: The business of peace: raiding and peace work along the Kenya-Uganda border. In: African Affairs 107:426, pp 89–110.

EBRD 2012: Country assessment Jordan. Retrieved 18 Feb 2015, from *http://www.ebrd.com/downloads/country/technical_assessments/jordan-assess.pdf*.

ECHO 2014: Factsheet Horn of Africa. Retrieved 08 Apr 2015, from *http://ec.europa.eu/echo/files/aid/countries/factsheets/hoa_en.pdf*.

ecolife 2011: What is grey water? Retrieved 15 Apr 2015, from *http://www.ecolife.com/define/grey-water.html*.

Elliot, Kimberly and Edward Collins 2012: Assessing the quality of aid for agriculture. Washington, DC: Center for Global Development.

Ember, Carol R.; Teferi Abate Adem; Ian Skoggard and Eric C. Jones 2012: Livestock raiding and rainfall variability in northwestern Kenya. In: Civil Wars 14:2, pp 159–181.

Enia, Jason 2008: Peace in its wake? The 2004 tsunami and internal conflict in Indonesia and Sri Lanka. In: Journal of Public & International Affairs 19:1, pp 7–27.

EPLO 2014: Support for peacebuilding and conflict prevention in the EU's external financing instruments 2014-2020. EPLO Briefing Paper 1/2014. Brussels: European Peacebuilding Liaison Office.

Erian, Wadid; Bassem Katlan and Ouldbdey Babah 2010: Global assessment report on Disaster Risk Reduction: drought vulnerability in the Arab region. Special case study: Syria. Geneva: UNISDR.

EurActiv 2014: Greenland, Denmark hope to reach uranium mining deal by end 2014. Retrieved 09 Jan 2015, from *http://www.euractiv.com/sustainability/greenland-denmark-expect-uranium-news-532667*.

European Commission 2008: Climate change and international security. Paper from the High Representative and the European Commission to the European Council. Retrieved 05 Jan 2015, from *http://www.consilium.europa.eu/uedocs/cms_data/librairie/PDF/EN_clim_change_low.pdf*.

European Commission 2011: Causes of the 2007-2008 food price crisis identified. Retrieved 25 Nov 2014, from *http://ec.europa.eu/environment/integration/research/newsalert/pdf/225na1.pdf*.

European Commission 2013a: Action plan for resilience in crisis prone countries 2013-2020. Commission staff working document. Brussels: European Commission.

European Commission 2013b: Climate change, environmental degradation, and migration. Commission staff working document. Retrieved 26 Mar 2015, from *http://ec.europa.eu/clima/policies/adaptation/what/docs/swd_2013_138_en.pdf*.

European Commission 2014: Commission implementing decision on the Annual Action Programme 2014 for the Instrument contributing to Stability and Peace to be financed from the general budget of the European Union. Retrieved 08 Apr 2015, from *http://ec.europa.eu/europeaid/sites/devco/files/annual-action-programme-icsp-part1-v5_en.pdf*.

European Commission 2015: Joint Programming Initiative. Retrieved 08 Apr 2015, from *http://ec.europa.eu/research/bioeconomy/policy/coordination/jpi/index_en.htm*.

European Environment Agency (EEA) 2010: The European environment: state and outlook 2010 — global megatrends. Copenhagen: EEA.

European Union 2015: Glossary. Retrieved 08 Apr 2015, from *http://avrupa.info.tr/resource-centre/glossary.html*.

Evans, Alex 2009: The feeding of the nine billion - global food security for the 21st century. London: Royal Institute of International Affairs.

Evans, Alex 2010: Resource scarcity, climate change and the risk of violent conflict. New York: New York University / Center on International Cooperation.

FAO 2000: Conflict and natural resources management. Rome: FAO.

FAO 2009: Climate change implications for fisheries and aquaculture. Overview of current scientific knowledge. Rome: FAO.

FAO 2010: The state of world fisheries and aquaculture, 2010. Rome: FAO.

FAO 2013: Adaptation in Action. FAO's work in climate change on adaptation. Retrieved 09 Apr 2015, from *http://www.fao.org/climatechange/fao-adapt/en/*.

FAO 2014a: FAO success stories on climate smart agriculture. Retrieved 11 Dec 2015, from *http://www.fao.org/3/a-i3817e.pdf*.

FAO 2014b: The state of world fisheries and aquaculture, 2014. Rome: FAO.

FAO and ADB 2013: Gender equality and food security: Women's empowerment as a tool against hunger. Manila: Asian Development Bank.

FAO and OECD 2011: Price volatility in food and agricultural markets: policy responses. Retrieved 08 Apr 2015, from *http://www.oecd.org/tad/agricultural-trade/48152638.pdf*.

FAO and WFP 2009: Crop and food security assessment mission to Ethiopia. Integrating the crop and food supply and the emergency food security assessments. Rome: FAO; WFP.

Fargione, Joseph; Jason Hill; David Tilman; Stephen Polasky and Peter Hawthorne 2008: Land clearing and the biofuel carbon debt. In: Science 319:5867, pp 1235–1238.

Faria, Fernanda 2011: Fragile states: a fluid concept for peacebuilding and statebuilding. Oslo: NOREF.

FCO; MoD and DFID 2014: The UK Government's approach to stabilisation. London: FCO; MoD; DFID.

Feakin, Tobias and Ducan Depledge 2010: Climate-related impacts on national security in Mexico and Central America. Final Report. London: Royal United Services Institute (RUSI).

Feldt, Heidi 2007: Natural resources and conflict. Berlin: Heinrich-Böll-Stiftung.

Femia, Francesco and Caitlin E. Werrell 2011: Thailand forecast: floods, droughts and political instability. Retrieved 02 Sep 2014, from *http://climateandsecurity.org/2011/11/14/thailand-forecast-floods-droughts-and-political-instability/*.

Femia, Francesco and Caitlin Werrell 2012: Syria: Climate change, drought and social unrest. Retrieved 18 Feb 2015, from *http://climateandsecurity.org/2012/02/29/syria-climate-change-drought-and-social-unrest/*.

Ferris, Elizabeth 2010: Natural disasters, conflicts and human rights: tracing the connections. Washington, DC: Brookings Institution Press.

Fetterer, Florence; Ken Knowles; Walt Meier and Matt Savoie 2012: Sea ice index. Retrieved 10 Dec 2014, from *http://nsidc.org/data/seaice_index/ index.html*.

Fettweis, Xavier; Bruno Franco; M. Tedesco; J. H. van Angelen; J.T.M. Lenaerts; M. R. van den Broeke and H. Gall 2013: Estimating the Greenland ice sheet surface mass balance contribution to future sea level rise using the regional atmospheric climate model MAR (Multilateral Aid Review). In: The Cryosphere 7:1, pp 469–489.

FEWS NET 2014: Coffee producer and laborer income to decline for a second consecutive year. Special Report Central America. Retrieved 24 Feb 2015, from *http://www.fews.net/sites/default/files/documents/reports/FEWS%20NET%20coffee%20rust%20shock%20report%20update_2014_02_en_0.pdf*.

Ficke, Ashley D.; Christopher A. Myrick and Lara J. Hansen 2007: Potential impacts of global climate change on freshwater fisheries. In: Reviews in Fish Biology and Fisheries 17:4, pp 581–613.

Findley, Sally E. 1994: Does drought increase migration? A study of migration from rural Mali during 1983-1985 drought. In: International Migration Review 28:3, pp 539–553.

Fischer, Günther; Eva Hizsnyik; Sylvia Prielder; Mahendra Shah and Harrij van Velthuizen 2009: Biofuels and food security. Vienna: International Institute for Applied Systems Analysis.

Fleischli, Susanne 2007: 'Women protesters carrying empty pots' – the role of gender in environmental conflict. Retrieved

11 Feb 2015, from http://www.ecc-platform.org/index.php?option=com_content&view=article&id=987:qwomen-protesters-carrying-empty-potsq--the-role-of-gender-in-environmental-conflict&catid=115.

Foresight 2011: Migration and global environmental change: future challenges and opportunities. London: Government Office for Science.

Francis, Jennifer A. and Stephen J. Vavrus 2012: Evidence linking Arctic amplification to extreme weather in mid-latitudes. In: Geophysical Research Letters 39:6, pp n/a.

Fritzsche, Kerstin; Schneiderbauer Stefan; Philip Bubeck; Stefan Kienberger; Mareike Buth; Marc Zebisch and Walter Kahlenborn 2014: The vulnerability sourcebook: concept and guidelines for standardised vulnerability assessments. Eschborn: Gesellschaft für Internationale Zusammenarbeit (GIZ).

Fund for Peace 2012: Failed states index 2012. Retrieved 10 Dec 2014, from library.fundforpeace.org/library/cfsir1210-failedstatesindex2012-06p.pdf.

Furness, Mark and Frank Vollmer 2013: EU joint programming: lessons from South Sudan for EU aid coordination. Bonn: Deutsches Institut für Entwicklungspolitik (DIE).

g7+ 2013: Note on the fragility spectrum. Retrieved 08 Apr 2015, from http://static.squarespace.com/static/5212dafbe4b0348bfd22a511/t/538e3f65e4b01aec8314ebe5/1401831269040/g7%2B+English+FS+Note+Design.pdf.

Gaillard, Jean-Christophe; Elsa Clavé and Ilan Kelman 2008: Wave of peace? Tsunami disaster diplomacy in Aceh, Indonesia. In: Geoforum 39:1, pp 511–526.

Gao, Yan; Margaret Skutsch; Omar Masera and Pablo Pacheco 2011: A global analysis of deforestation due to biofuel development. Bogor Barat: Center for International Forestry Research.

Gasparatos, A.; P. Stromberg and K. Takeuchi 2013: Sustainability impacts of first-generation biofuels. In: Animal Frontiers 3:2, pp 12–26.

GCCA 2015a: Piloting budget support for climate change. Retrieved 08 Apr 2015, from http://www.gcca.eu/about-the-gcca/innovative-and-effective-approaches/piloting-budget-support-for-climate-change.

GCCA 2015b: Ressources financières. Retrieved 08 Apr 2015, from http://www.gcca.eu/fr/a-propos-de-lamcc/ressources-financieres.

Gebreluel, Goitom 2014: Ethiopia's Grand Renaissance Dam: ending Africa's oldest geopolitical rivalry? In: Washington Quarterly 37:2, pp 25–37.

Gehrig, Jason and Mark M. Rogers 2009: Water and conflict: incorporating peacebuilding into water development. Retrieved 08 Apr 2015, from http://www.indiaenvironmentportal.org.in/files/waterconflict.pdf.

Gemenne, François; Jon Barnett; W. Neil Adger and Geoffrey D. Dabelko 2014: Climate and security. evidence, emerging risks, and a new agenda. In: Climatic Change 123:1, pp 1–9.

German, Laura; George C. Schoneveld and Pablo Pacheco 2011: The social and environmental impacts of biofuel feedstock cultivation: evidence from multi-site research in the forest frontier. In: Ecology and Society 16:3, p 24.

Germanwatch 2014: Global climate risk index 2015. Who suffers most from extreme weather events? Weather-related loss events in 2013 and 1994 to 2013. Bonn: Germanwatch.

Gerschewski, Johannes 2013: The three pillars of stability: legitimation, repression, and co-optation in autocratic regimes. In: Democratization 20:1, pp 13–38.

Ginzky, Harald; Friederike Herrmann; Karin Kartschall; Wera Leujak; Kai Lipsius; Claudia Mäder; Sylvia Schwermer and Georg Straube 2011: Geoengineering: effective climate protection or megalomania? Methods – statutory framework – environment policy demands. Dessau-Rosslau: Umweltbundesamt.

GIZ 2010: Climate proofing for development. Adapting to climate change, reducing risk. Eschborn: GIZ.

GIZ 2013: A source of peace - transboundary water management in Central Asia. Bishkek: GIZ.

GIZ and WRI 2011: Making adaptation count: concepts and options for monitoring and evaluation of climate change adaptation. Eschborn: GIZ.

Global Sustainability Institute 2014: Climate change, resource scarcity and the risk of human conflict: case studies of shared water resources in the Indian subcontinent (GRO report). Cambridge: Anglia Ruskin University.

Global Witness 2014: Peru's deadly environment – the rise in killings of environmental and land defenders. Retrieved 10 Dec 2014, from http://www.globalwitness.org/perudeadlyenvironment/docs/peru_deadly_environment_en.pdf.

Goulden, Marisa; Roger Few; Lulsegged Abebe; Nick Brooks; Mona Daoud; Mamadou Kani Konaté; Elizabeth Sarney; Dan Smith; Boniface Umoh; Phil Vernon; Julia Weiner and Boubacar Yamba 2011: Climate change, water and conflict in the Niger River Basin. Norwich: International Alert and University of East Anglia.

Government of Kenya 2013: National Climate Change Action Plan. Retrieved 11 Feb 2015, from http://cdkn.org/wp-content/uploads/2013/03/Kenya-National-Climate-Change-Action-Plan.pdf.

Government of Myanmar 2012: Myanmar's National Adapation Programme of Action (NAPA) to climate change. Retrieved 16 Feb 2015, from http://unfccc.int/resource/docs/napa/mmr01.pdf.

Government of Rwanda 2013: Western Province Ngororero district. Retrieved 25 Nov 2014, from *http://www.ngororero.gov.rw/uploads/media/NGORORERO_DISTRICT_DDP_2____2013-2018.pdf*.

Government of the United Kingdom 2011: Multilateral aid review: assessment of UN Peacebuilding Fund (PBF). Retrieved 08 Apr 2015, from *https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/224934/pbf.pdf*.

Gregory, P. J.; Ingram, J. S. I. and M. Brklacich 2005: Climate change and food security. In: Philosophical Transactions of the Royal Society B-Biological Sciences 360:1463, pp 2139–2148.

Gross Stein, Janice 2013: Threat perception in international relations. In: Huddy, Leonie; Sears, David O.; Levy, Jack S. (ed.): The Oxford handbook of political psychology. Oxford: Oxford University Press.

Grover, Velma; Abdel Raouf Darwish and Eliza Deutsch 2010: Integrated water resources management in Jordan. Retrieved 08 Apr 2015, from *http://www.erf.org.eg/CMS/uploads/pdf/1290796086_Envi_Nov_01.pdf*.

Gutner, Tammi 1999: The political economy of food subsidy reform in Egypt. Washington, DC: IFPRI.

Haan, Arjan de 2000: Migrants, livelihoods, and rights: the relevance of migration in development policies. London: DFID.

Hallegatte, Stephane; Colin Green; Robert J. Nicholls and Jan Corfee-Morlot 2013: Future flood losses in major coastal cities. In: Nature Climate Change 3:9, pp 802–806.

Harari, Nicole and Jesse Roseman 2008: Environmental peacebuilding: theory and practice: a case study of the Good Water Neighbours Project and in depth analysis of the Wadi Fukin / Tzur Hadassah communities. Ammam, Bethlehem and Tel Aviv: EcoPeace; Friends of the Earth Middle East.

Hardy, James and Sean O'Connor 2014: China building airstrip-capable island on Fiery Cross Reef. Retrieved 10 Dec 2014, from *http://www.janes.com/article/46083/china-building-airstrip-capable-island-on-fiery-cross-reef*.

Harris, Katie; David Keen and Tom Mitchell 2013: When disasters and conflict collide: improving links between disaster resilience and conflict prevention. London: Overseas Development Institute (ODI).

Headey, Derek and Shenggen Fan 2010: Reflections on the global food crisis: how did it happen? How has it hurt? And how can we prevent the next one? Washington, DC: IFPRI.

Heijman, Annelies; Ifeanyi Okechukwu; Annemarie Schuller and Regine Skarubowiz 2009: A grassroots perspective on risks stemming from disasters and conflict. In: Humanitarian Exchange Magazine 44:1, pp 34–35.

Hendrix, Cullen S. and Henk-Jan Brinkman 2013: Food insecurity and conflict dynamics: causal linkages and complex feedbacks. In: Stability: International Journal of Security and Development 2:26, pp 1–18.

Hendrix, Cullen S. and Stephan Haggard 2015: Global food prices, regime type, and urban unrest in the developing world. In: Journal of Peace Research 52:2, pp 143–157.

Hendrix, Cullen S. and Idean Salehyan 2012: Climate change, rainfall, and social conflict in Africa. In: Journal of Peace Research 49:1, pp 35–50.

Hennings, Anne 2014: Das Konfliktpotenzial exklusiver Land Grabbing Praktiken. Retrieved 09 Jan 2015, from *http://www.afk-web.de/fileadmin/afk-web.de/data/zentral/dokumente/AFK-Kolloquium_2014/Paperroom_2014/Hennings_Paper.pdf*.

High-Level Task Force on the Global Food Security Crisis 2008: Comprehensive framework for action. Retrieved 08 Apr 2015, from *http://www.un.org/en/issues/food/taskforce/Documentation/CFA%20Web.pdf*.

Hijioka, Y.; E. Lin; J. J. Pereira; R. T. Corlett; X. Cui; G. E. Insarov; R. D. Lasco; E. Lindgren and A. Surjan 2014: 2014: Asia. In: Barros, V. R.; Field, C. B.; Dokken, D. J.; M. D. Mastrandrea; K. J. Mach; T. E. Bilir; M. Chatterjee; K. L. Ebi; Y. O. Estrada; R. C. Genova; B. Girma; E. S. Kissel; A. N. Levy; S. MacCracken; P. R. Mastrandrea; L. L. White (eds.): Climate change 2014: impacts, adaptation, and vulnerability. Part B: Regional aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge and New York: Cambridge University Press.

Hilker, Lyndsay 2012: Empowerment in fragile states and situations of fragility. In: OECD (ed.): Poverty reduction and pro-poor growth: the role of empowerment. Paris: OECD.

Hoffmann, Susanna M. and Anthony Oliver-Smith (eds.) 2002: Culture and catastrophe: the anthropology of disaster. Santa Fe, NM: The School of American Research Press.

Holter, Mikael 2015: Oil exploration in Norway's Arctic cut by half after crude crash. Retrieved 08 Apr 2015, from *http://www.bloomberg.com/news/articles/2015-02-17/oil-exploration-in-norway-s-arctic-cut-by-half-after-crude-crash*.

Houdret, Annabelle 2008: Scarce water, plenty of conflicts? Local water conflicts and the role of development cooperation. Duisburg: INEF.

Houdret, Annabelle; Annika Kramer and Alexander Carius 2010: The water security nexus. Challenges and opportunities for development cooperation. Eschborn: GIZ.

Houghton, Katherine 2012: Climate change in fragile states: adaptation as reinforcement of the fabric of the state. In: Hamza, Mohamed; Corendea, Cosmin (eds.): Climate change and fragile states: rethinking adaptation. Bonn: UNU-EHS.

House of Commons 2013: International Development Committee. Written evidence submitted by Adam Smith International. Retrieved 18 Feb 2015, from *http://www.publications.parliament.uk/pa/cm201314/cmselect/cmintdev/334/334we10.htm*.

Huebert, Rob; Heather Exner-Pirot; Adam Lajeunesse and Jay Gulledge 2012: Climate change and international security: the Arctic as a bellwether. Arlington, VA: Center for Climate and Energy Solutions.

Hughes, Jacob; Ted Hooley; Safia Hage and George Ingram 2014: Implementing the New Deal for Fragile States. Washington, DC: Brookings Institution.

Human Rights Watch 2005: Sexual violence and its consequences among displaced persons in Darfur and Chad. A Human Rights Watch Briefing Paper. Retrieved 08 Apr 2015, from *http://www.cmi.no/sudan/doc/?id=1069*.

Human Rights Watch 2013: 'That land is my family's wealth': addressing land dispossessions after Côte d'Ivoire's post-election conflict. New York: Human Rights Watch.

Hunter, L. M. and E. David 2011: Displacement, climate change and gender. In: Piguet, Etienne; Pecoud, Antoine; Guchteneire, Paul de (eds.): Migration and climate change. Cambridge: Cambridge University Press.

IASC 2006: Operational guidelines on human rights and natural disasters. Washington, DC: Inter-Agency Standing Committee.

IEA 2006: World energy outlook 2006. Paris: International Energy Agency (IEA).

IEA 2014: World energy investment outlook. Paris: IEA.

IFAD 2014: The gender advantage: women on the front line of climate change. Rome: IFAD.

IFPRI 2013: Definitions of resilience: 1996-present. Retrieved 16 Mar 2015, from *http://www.2020resilience.ifpri.info/files/2013/08/resiliencedefinitions.pdf*.

IFRC 2012: The road to resilience: bridging relief and development for a more sustainable future. Geneva: International Federation of the Red Cross.

IMF 2014: Arab countries in transition: an update on economic outlook and key challenges. Washington, DC: International Monetary Fund.

Index Mundi 2014: Guatemala economy profile 2014. Retrieved 08 Apr 2015, from *http://www.indexmundi.com/guatemala/economy_profile.html*.

Institute for Agriculture and Trade Policy 2012: Grain reserves and the food price crisis. Selected writings from 2008–2012. Retrieved 08 Apr 2015, from *www.iatp.org*.

Inter-American Development Bank 2014: IDB annual report 2013. Retrieved 21 Dec 2014, from *http://publications.iadb.org/handle/11319/6422*.

International Alert forthcoming: Case study Ngororero, Rwanda, 2013. London: International Alert.

International Alert 2014: Results from field research and consultations in Aman. London: International Alert.

International Coffee Organization 2013: Report on the outbreak of coffee leaf rust in Central America and action plan to combat the pest. Retrieved 08 Apr 2015, from *http://dev.ico.org/documents/cy2012-13/ed-2157e-report-clr.pdf*.

International Crisis Group 2014a: The security challenges of pastoralism in Central Africa. Brussels: International Crisis Group.

International Crisis Group 2014b: Water pressures in Central Asia. Brussels: International Crisis Group.

International Dialogue on Peacebuilding and Statebuilding 2011: A New Deal for Engagement in Fragile States. Retrieved 08 Apr 2015, from *http://www.g7plus.org/new-deal-document/*.

International Dialogue on Peacebuilding and Statebuilding 2014: New Deal monitoring report 2014. Retrieved 16 Mar 2015, from *http://www.pbsbdialogue.org/documentupload/FINAL%202014%20New%20Deal%20Monitoring%20Report.pdf*.

International Institute for Strategic Studies 2011: The IISS transatlantic dialogue on climate change and security. Report to the European Commission. Retrieved 10 Dec 2014, from *http://www.iiss.org/-/media/Documents/Climate%20change%20%20security%20FinalReport.pdf*.

International Peace Institute 2012: Busan and beyond: implementing the "New Deal" for fragile states. New York and Vienna: IPI.

interpeace 2010: What is peacebuilding? Do no harm, conflict-sensitivity and peacebuilding. Retrieved 08 Apr 2015, from *http://www.interpeace.org/publications/peacebuilding-and-policy-resources/146-what-is-peacebuilding-do-no-harm-conflict-sensitivity-and-peacebuilding/file*.

IPCC 2007a: Climate change 2007: climate change impacts, adaptation and vulnerability. Geneva: Cambridge University Press.

IPCC 2007b: Climate change: impacts, adaptation and vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge and New York: Cambridge University Press.

IPCC 2013: Climate change 2013: the physical science basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge and New York: Cambridge University Press.

IPCC 2014: Climate change 2014: impacts, adaptation, and vulnerability. Part A: global and sectoral aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge and New York: Cambridge University Press.

IRIN News 2009: Kenya: what drives conflict in northern Kenya? Retrieved 08 Apr 2015, from *http://www.irinnews.org/report/87450/kenya-what-drives-conflict-in-northern-kenya*.

Jamasmie, Cecilia 2014: Thousands of Peruvians protest against tougher illegal mining rules. Retrieved 08 Apr 2015, from *http://www.mining.com/thousands-of-peruvians-protest-against-tougher-illegal-mining-rules/*.

Johnson Williams, Vereda 2011: A case study of desertification in Haiti. In: Journal of Sustainable Development 4:3, pp 20–31.

Joyner, Christopher 1999: The Spratly Islands dispute in the South China Sea: problems, policies and prospects for diplomatic accommodation. In: Singh, Ranjeet (ed.): Investigating confidence-building measures in the Asia-Pacific Region. Washington, DC: Stimson Center.

Kantor, Brooke 2014: 'Dam-ed if you don't': Egypt and the Grand Ethiopian Renaissance Dam project. Retrieved 26 Mar 2015, from *http://harvardpolitics.com/hprgument-posts/dam-ed-dont-egypt-grand-ethiopian-renaissance-dam-project/*.

Kaplan, Seth 2009: Identity in fragile states. Social cohesion and state building. In: Development 52:4, pp 466–472.

Käpylä, Juha and Harri Mikkola 2013: Arctic conflict potential: towards an extra-Arctic perspective. Helsinki: Finnish Institute of International Affairs.

Kellet, J. and D. Sparks 2012: Disaster risk reduction: spending where it should count. Bristol: Development Initiatives.

Kelley, Colin P.; Shahrzad Mohtadi; Mark A. Cane; Richard Seager and Yochanan Kushnir 2014: Climate change in the Fertile Crescent and implications of the recent Syrian drought. In: Proceedings of the National Academy of Sciences of the United States of America 112:11, pp 3241–3246.

Khan, Moazzam Ali; Pandey Nisha and Janani Vivekananda 2013: Strengthening responses to climate variability in South Asia - discussion paper Pakistan. London: International Alert.

Kharas, Homi and Geoffrey Gertz 2010: The new global middle class: a crossover from west to east. In: Li, Cheng (ed.): China's emerging middle class: beyond economic transformation. Washington, DC: Brookings Institution Press.

Kiehl, Jeffrey T. 2008: Geoengineering climate change: treating the symptom over the cause? In: Climatic Change 77:3-4, pp 227–228.

Kirkbride, Mary and Richard Grahn 2008: Survival of the fittest: pastoralism and climate change in East Africa. Oxford: Oxfam International.

Kissinger, Gabrielle and Thinley Namgyel 2013: NAPAs and NAPs in least developed countries. Retrieved 26 Mar 2015, from *https://ldcclimate.files.wordpress.com/2013/12/ldcp13_napas-and-naps.pdf*.

Kluyskens, Jups and Lance Clark 2014: Review of the United Nations Peacebuilding Fund. Retrieved 26 Mar 2015, from *http://www.unpbf.org/wp-content/uploads/Final-Report-May-UN-PBF.pdf*.

Koprucu, Feza 2011: Ethiopian land grab. Retrieved 17 Nov 2014, from *http://www1.american.edu/ted/ice/ethiopia-land-swap.htm*.

Kostner, Markus and Rina Meutia 2011: Considerations for responding to natural disasters in situations of fragility and conflict. Geneva: Proceedings of the World Reconstruction Conference.

Kreft, S.; D. Eckstein; L. Junghans; C. Kerestan and U. Hagen 2014: Global Climate Risk Index 2015. Bonn: Germanwatch.

Kugelman, Michael and Robert Hathaway 2009: Running on empty: Pakistan's water crisis. Washington, DC: Woodrow Wilson International Center for Scholars.

Kyrgyzstan Inquiry Commission 2011: Report of the Independent Commission of Inquiry into the events in Southern Kyrgyzstan in June 2010. Retrieved 18 Feb 2015, from *http://reliefweb.int/sites/reliefweb.int/files/resources/Full_Report_490.pdf*.

Lagarde, Christine 2014: A new multilateralism for the 21st century: the Richard Dimbleby lecture. Retrieved 10 Dec 2014, from *https://www.imf.org/external/np/speeches/2014/020314.htm*.

Laghari, Javaid R. 2013: Climate change: melting glaciers bring energy uncertainty. In: Nature 502:7473, pp 617–618.

LaGraffe, Daniel 2012: The youth bulge in Egypt: an intersection of demographics, security, and the Arab Spring. In: Journal of Strategic Security 5:2, pp 65–80.

Lally, Mike 2010: Spratly Islands strategic importance and rising sea levels: inventory of conflict and environment case studies 226. Retrieved 08 Apr 2015, from *http://www1.american.edu/ted/ice/spratly-submerge.html*.

Lavell, A.; M. Oppenheimer; M. Diop; J. Hess; R. Lempter; J. Li; R. Muir-Wood and S. Myeong 2012: Climate change: new dimensions in disaster risk, exposure, vulnerability, and resilience. In: Field, C. B.; Barros, V.; Stocker, T. F.; D. Qin; D. J. Dokken; K. L. Ebi; M. D. Mastrandrea; K. J. Mach; G.-K. Plattner; S. K. Allen; M. Tignor; P. M. Midgley (eds.): Managing the risks of extreme events and disasters to advance climate change adaptation. Special report of the Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC). New York: Cambridge University Press.

LDC Expert Group 2012: National adaptation plans: technical guidelines for the national adaptation plan process. Retrieved 08 Apr 2015, from *http://unfccc.int/files/adaptation/cancun_adaptation_framework/application/pdf/naptechguidelines_eng_high__res.pdf*.

Leader, Nicholas and Peter Colenso 2005: Aid instruments in fragile states (PRDE Working Paper 5). London: DFID.

Lecoutere, Els; Ben D'Exelle and Bjorn van Campenhout 2010: Who engages in water scarcity conflicts? A field experiment with irrigators in semi-arid Africa. Research Working Paper 31. Brighton: MICROCON.

Lee, Bernice; Felix Preston; Jaakko Kooroshy; Rob Bailey and Glada Lahn 2012: Resources futures. London: Royal Institute of International Affairs.

Lehmann, Paul; Miriam Brenck; Oliver Gebhardt; Sven Schaller and Elisabeth Süßbauer 2012: Understanding barriers and opportunities for adaptation planning in cities. Leipzig: Helmholtz-Zentrum für Umweltforschung GmbH - UFZ.

Levine, Simon; Katie Peters and Lilianne Fan 2014: Conflict, climate change and politics: why a techno-centric approach fails the resilience challenge. London: ODI.

Lindholt, Lars 2007: Arctic natural resources in a global perspective. In: Glomsrød, Solveig; Aslaksen, Iulie (ed.): The economy of the North. Oslo: Statistics Norway.

Link, Michael; Franziska Piontek; Jürgen Scheffran and Janpeter Schilling 2012: On foes and flows: vulnerabilities, adaptive capacities and transboundary relations in the Nile River Basin in times of climate change. In: L'Europe en Formation 365:1, pp 99—138.

Lisztwan, Julia 2012: Stability of maritime boundary agreements. In: Yale Journal of International Law 37:1, pp 154—200.

Lobell, David B. and Sharon M. Gourdji 2012: The influence of climate change on global crop productivity. In: Plant Physiology 60:4, pp 1686—1697.

Luboyera, Festus 2003: UNFCCC national communications process/ linkages with AIACC. Presentation at the AIACC Africa and Indian Ocean Islands Regional Workshop Dakar: UNFCCC Secretariat.

Maas, Achim and Alexander Carius 2012: Territorial integrity and sovereignty: climate change and security in the Pacific and beyond. In: Scheffran, Jürgen; Brzoska, Michael; Brauch, Hans Günter; Michael Link; Janpeter Schilling (eds.): Climate change, human security and violent conflict - challenges for societal stability. Berlin: Springer.

Margulis, Sergio and Gordon Hughes 2005: An economic analysis of natural resources sustainability in Mozambique. World Bank. Retrieved 18 Feb 2015, from *http://www.cbd.int/financial/values/Mozambique-EconomicAnalysis.doc*.

Marine Resource Assessment Group 2005: Review of impacts of illegal, unreported and unregulated fishing on developing countries. Final report. London: Marine Resource Assessment Group.

Matthew, Richard and Anne Hammill 2012: Peacebuilding and adpatation to climate change. In: Jensen, David; Lonergan, Steve (eds.): Assessing and restoring natural resources in post-conflict peacebuilding. New York: Earthscan.

Mcloughlin, Claire 2012: GSDRC topic guide on fragile states. Governance and Social Development Resource Centre. Retrieved 18 Feb 2015, from *http://www.gsdrc.org/docs/open/CON86.pdf*.

Means, Katherine; Cynthia Josayma and Nielsen, Erik, Viriyasakultorn, Vitoon 2002: Community-based forest resource conflict management: a training package. Rome: FAO.

Melillo, Jerry; Terese Richmond and Gary Yohe 2014: Climate change impacts in the United States: the third National Climate Assessment. Washington, DC: US Global Change Research Program.

Mercy Corps 2013: What really matters for resilience? Exploratory evidence on the determinants of resilience to food security shocks in Southern Somalia. Portland: Mercy Corps.

Messer, Ellen; Marc J. Cohen and Thomas Marchione 2002: Conflict: a cause and effect of hunger. Washington, DC: Woodrow Wilson International Center for Scholars.

Meyerhoff, Sarah 2014: 'Extreme realities' sheds light on links between global climate dynamics and national security. Retrieved 09 Feb 2015, from *http://www.newsecuritybeat.org/2014/12/extreme-realities-sheds-light-links-global-climate-dynamics-national-security/*.

Meynen, Nick and Leah Temper 2014: Behind the veil of the Islamic State is a war for water. Retrieved 10 Feb 2015, from *http://www.ejolt.org/2014/09/behind-the-veil-of-the-islamic-state-is-a-war-for-water/*.

Millennium Ecosystem Assessment 2005: Ecosystems and human well-being: synthesis. Washington, DC: Island Press.

Ministry of Environment and the Protection of Nature, Republic of Senegal 2010: Second national communication: United Nations Framework Convention on Climate Change. Retrieved 08 Apr 2015, from *http://unfccc.int/resource/docs/natc/sennc2exsum.pdf*.

Mitra, Shreya; Nisha Pandey and Janani Vivekananda 2013: Strengthening responses to climate variability in South Asia - Discussion Paper India. London: International Alert.

Mitra, Shreya and Janani Vivekananda 2013: Strengthening responses to climate variability in South Asia. London: International Alert.

Mittal, Anuradha 2013: Indian land grabs in Ethiopia show dark side of south-south cooperation. Retrieved 10 Feb 2015, from *http://www.theguardian.com/global-development/poverty-matters/2013/feb/25/indian-land-grabs-ethiopia*.

Modola, Siegfried 2013: Fishing and firearms on Lake Turkana. Retrieved 18 Feb 2015, from *http://africacenter.colostate.edu/content/fishing-and-firearms-lake-turkana*.

Mundt, Alexander 2011: Addressing the legacy of conflict in Darfur: shifting land tenure patterns and humanitarian action. Retrieved 16 Mar 2015, from *http://www.refugeecooperation.org/publications/Sudan/04_mundt.php*.

Murphy, Sophia 2013: Land grabs and fragile food systems. The role of globalization. Minneapolis: Institute for Agriculture and Trade Policy.

Mustafa, Daanish; Majed Akhter and Natalie Nasrallah 2013: Understanding Pakistan's water-security nexus. Washington, DC: US Institute of Peace.

MWI Jordan 2008: Water for life: Jordan's water strategy - 2008-2022. Ministry of Water and Irrigation. Retrieved 16 Mar 2015, from *http://www.irinnews.org/pdf/jordan_national_water_strategy.pdf*.

NASA 2013: Arctic sea ice minimum in 2013 is sixth lowest on record. Retrieved 09 Jan 2015, from *http://www.nasa.gov/content/goddard/arctic-sea-ice-minimum-in-2013-is-sixth-lowest-on-record/#.VNR8xXvftVo*.

Nawaz Khan, A. 2010: Climate change adaptation and disaster risk reduction in Pakistan. In: Shaw, Rajib; Pulhin, Juan; Pereira, Joy (eds.): Climate change adaptation and disaster risk reduction: An Asian perspective. Bingley: Emerald Group.

Nellemann, C.; M. MacDevette; T. Manders; B. Eickhout; B. Svihus; A. G. Prins und B. P. Kaltenborn (eds.) 2009: The environmental food crisis: The environment's role in averting future food crises. A UNEP rapid response assessment. Arendal and Nairobi: UNEP; GRID-Arendal.

Neumayer, Eric and Thomas Plümper 2007: The gendered nature of natural disasters: the impact of catastrophic events on the gender gap in life expectancy, 1981–2002. London: London School of Economics and Political Science; University of Essex; Max Plank Institute for Economics.

Ngabitsinze, Jean C.; Adrie Mukashema; Mireille Ikirezi and Fidèle Niyitanga 2011: Planning and costing adaptation of perennial crop systems to climate change: Coffee and banana in Rwanda case study report. London: International Institute for Environment and Development (IIED).

Niazi, Shamim 2013: To build peace, confront Afghanistan's natural resource paradox. Retrieved 08 Apr 2015, from *http://www.newsecuritybeat.org/2013/09/build-peace-confront-afghanistans-natural-resource-paradox/*.

Nicholls, Robert J. and Anny Cazenave 2010: Sea-level rise and its impact on coastal zones. In: Science 328:5985, pp 1517–1520.

Nile Basin Initiative 2012: State of the River Nile Basin 2012. Entebbe, Uganda: Nile Basin Initiative.

Nindang, S. and T. Allen 2012: Ahead of flood season, Thailand's communities demand greater preparedness. Retrieved 02 Sep 2014, from *http://asiafoundation.org/in-asia/2012/08/08/ahead-of-flood-season-thailands-communities-demand-greater-preparedness/*.

Njiru, Beth Njeri 2012: Climate change, resource competition, and conflict amongst pastoral communities in Kenya. In: Scheffran, Jürgen; Brzoska, Michael; Brauch, Hans Günter; Peter Michael Link; Janpeter Schilling (eds.): Climate change, human security and violent conflict - challenges for societal stability. Berlin: Springer.

NRC and IDMC 2014: Global estimates 2014. People displaced by disasters. Geneva: Norwegian Refugee Council; Internal Displacement Monitoring Centre.

Nussbaumer, Patrick and Anthony Patt 2009: Climate vulnerability in Mozambique: current state and outlook into the future. In: IOP Conference Series: Earth and Environmental Science 41:6, pp n.a.

Ober, Kayly 2014: Migration as adaptation. Exploring mobility as a coping strategy for climate change. Oxford: UK Climate Change and Migration Coalition.

OCHA 2013: Global overview of 2012 pooled funding CERF, CHFs and ERFs. Retrieved 27 Mar 2015, from *https://docs.unocha.org/sites/dms/Documents/Global%20Overview%20of%202012%20Pooled%20Funding%20-%20CERF,%20CHFs%20and%20ERFs.pdf*.

OCHA 2014: 2014-2016 strategic response plan. Sahel region. Retrieved 24 Feb 2015, from *http://www.fao.org/fileadmin/user_upload/newsroom/docs/Regional%20Sahel%20SRP%20Final.pdf*.

OECD 2007: Principles for good international engagement in fragile states & situations. Paris: OECD.

OECD 2008a: Concepts and dilemmas of state building in fragile situations. Paris: OECD/DAC.

OECD 2008b: Resource flows to fragile and conflict-affected states. Paris: OECD.

OECD 2009: Integrating climate change adaptation into development co-operation: policy guidance. Paris: OECD.

OECD 2010: The state's legitimacy in fragile situations: unpacking complexity. Paris: OECD.

OECD 2011: What does 'resilience' mean for donors? Paris: OECD.

OECD 2013a: Financing water and sanitation in developing countries. The contribution of external aid. Paris: OECD.

OECD 2013b: Fragile states 2013: resource flows and trends in a shifting world. Paris: OECD.

OECD 2013c: International development statistics online database. Retrieved 26 Mar 2015, from *www.oecd.org/dac/stats/idsonline*.

OECD 2014a: Fragile states 2014 domestic revenue mobilisation in fragile states. Paris: OECD.

OECD 2014b: Guidelines for resilience systems analysis: how to analyse risk and build a roadmap to resilience. Paris: OECD.

Okereke, Chukwumerije; Prajwal Baral and Yamide Dagnet 2014: Options for adaptation and loss & damage in a 2015 climate agreement. Working paper. Washington, DC: Agreement on Climate Transformation 2015.

OOSKAnews 2014: Twenty-two killed in water, and conflicts in Kenya's northern rangelands. Retrieved 08 Apr 2015, from *https://www.ooskanews.com/story/2014/11/twenty-two-killed-water-and-conflicts-kenya-s-northern-rangelands_162853*.

Oswald Spring, Ursula 2008: Gender and disasters: human, gender and environmental security - a huge challenge. Bonn: United Nations University, Institute for Environment and Human Security.

Overland, James E.; Muyin Wang; John E. Walsh and Julienne C. Stroeve 2013: Future Arctic climate changes: adaptation and mitigation time scales. In: Earth's Future 2:1, pp 1–7.

Oxfam 2012: Extreme weather, extreme prices: the costs of feeding a warming world. Retrieved 16 Feb 2015, from *http://www.oxfam.org/sites/www.oxfam.org/files/20120905-ib-extreme-weather-extreme-prices-en.pdf*.

Pacific Institute 2010: World water quality facts and statistics. Retrieved 10 Feb 2015, from *http://www.pacinst.org/wp-content/uploads/sites/21/2013/02/water_quality_facts_and_stats3.pdf*.

Parry, M. L.; O. F. Canziani; J. P. Palutikof; van der Linden, P.J. und C. E. Hanson (eds.) 2007: Climate change 2007: impacts, adaptation and vulnerability - contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge and New York: Cambridge University Press.

Paskal, Cleo 2007: How climate change is pushing the boundaries of security and foreign policy. Briefing paper. London: Chatham House.

Patel, Raj and Philip McMichael 2009: A political economy of the food riot. In: Review, A Journal of the Fernand Braudel Center 32:1, pp 9–36.

Patel, Toral; Ahmad Dhiaulhaq; David Gritten; Yurdi Yasmi and Toon de Bruyn 2013: Predicting future conflict under REDD+ implementation. In: Forests 4:2, pp 343–363.

Pearce, Fred 2015: On the River Nile, a move to avert a conflict over water. In: Yale Environment 360. Retrieved 07 Apr 2015, from *http://e360.yale.edu/feature/on_the_river_nile_a_move_to_avert_a_conflict_over_water/2855/*.

Peebles, Graham 2013: Ethiopia: lives for land in Gambella. Retrieved 24 Nov 2014, from *http://mwcnews.net/focus/analysis/29243-land-in-gambella.html*.

Peek, Katie 2014: Where will the world's water conflicts erupt? A heatmap of war over water. In: Popular Science: The Water Issue, June 2014. Retrieved 10 Dec 2014, from *http://www.popsci.com/article/science/where-will-worlds-water-conflicts-erupt-infographic?src=SOC&dom=tw*.

Peel, Michael 2014: Villagers count cost of Myanmar dam project. Retrieved 24 Jul 2014, from *http://www.ft.com/cms/s/0/edc7a794-aff1-11e3-b0d0-00144feab7de.html*.

Pereria, Alisa 1998: Cauvery water dispute. Inventory of Conflict and Environment (ICE) no. 53. Washington, DC: American University.

Permanent Court of Arbitration 2014: Bay of Bengal maritime boundary arbitration between Bangladesh and India. Retrieved 08 Apr 2015, from *http://www.pca-cpa.org/showpage.asp?pag_id=1376*.

Permanent Mission of Solomon Islands to the United Nations 2009: Solomon Islands national submission on climate change and possible security implications. Submission to the 64th Session of the UN General Assembly 2009. Retrieved 08 Apr 2015, from *http://www.un.org/depts/los/clcs_new/submissions_files/preliminary/slb_preliminaryinfo.pdf*.

Peters, Katie and Janani Vivekananda 2014: Topic guide: conflict, climate and environment. London: ODI and International Alert.

Pietschmann, Elena 2014: Forgotten or unpromising? The elusive phenomenon of under-aided countries, sectors and sub-national regions. Bonn: Deutsches Institut für Entwicklungspolitik (DIE).

Pohl, Benjamin; Alexander Carius; Ken Conca; Geoffrey D. Dabelko; Annika Kramer; David Michel; Susanne Schmeier; Ashok Swain and Aaron Wolf 2014: The rise of hydro-diplomacy. Strengthening foreign policy for transboundary waters. Berlin: Adelphi.

Poulton, Robin-Edward and Ibrahim Youssouf 1998: A peace of Timbuktu: democratic governance, development and African peacemaking. New York and Geneva: United Nations.

Prakash, Anjal and R. K. Sama 2006: Contending water uses - social undercurrents in a water-scarce village. In: Economic and Political Weekly 41:7, pp 577–579.

Prosterman, Roy 2011: Egypt's landless have no love for Mubarak. Retrieved 30 Mar 2015, from *http://www.theguardian.com/global-development/poverty-matters/2011/feb/08/egypt-landless-mubarak*.

Ramalingam, Ben; Miguel Laric and John Primros 2014: From best practice to best fit: understanding and navigating wicked problems in international development. London: ODI.

Rasch, P. J.; S. Tilmes; R. P. Turco; A. Robock; L. Oman; C. C. Chen and Stenchikov 2008: An overview of geoengineering of climate using stratospheric sulphate aerosols. In: Philosophical Transactions of the Royal Society A: Mathematical Physical and Engineering Sciences 366:1882, pp 4007–4037.

Ratner, Blake D.; Clementine Burnley; Samuel Mugisha; Elias Madzudzo; Il Oeur; Mam Kosal; Lukas Rüttinger; Loziwe Chilufya and Paola Adriázola 2014: Investing in collaboration to manage environmental resource conflict. Policy brief. Collaborating for Resilience.

Renner, Michael and Zoe Chafe 2007: Beyond disasters: creating opportunities for peace. Washington, DC: Worldwatch Institute.

Renzio, Paolo de 2007: Aid effectiveness and absorptive capacity: Which way aid reform and accountability? Opinion. London: DFID.

Richards, Alan 2002: Coping with water scarcity: The governance challenge. San Diego: Institute on Global Conflict and Cooperation, University of California.

Rocha Menocal, Alice and Timothy Othieno 2008: The World Bank in fragile situations: an issues paper. Retrieved 07 Jan 2015, from *http://www.odi.org/resources/docs/4341.pdf*.

Rockström, Johan; Will Steffen; Kevin Noone; Åsa Persson; F. Stuart Chapin; Eric F. Lambin; Timothy M. Lenton; Marten Scheffer; Carl Folke; Hans Joachim Schellnhuber; Björn Nykvist; de Wit, Cynthia A.; Terry Hughes; van der Leeuw, Sander; Henning Rodhe; Sverker Sörlin; Peter K. Snyder; Robert Costanza; Uno Svedin; Malin Falkenmark; Louise Karlberg; Robert W. Corell; Victoria J. Fabry; James Hansen; Brian Walker; Diana Liverman; Katherine Richardson; Paul Crutzen and Jonathan A. Foley 2009: A safe operating space for humanity. In: Nature 461:4, pp 472–475.

Royo Aspa, Josep-Maria 2011: The economic relationship of armed groups with displaced populations. In: Forced Migration Review 37:1, pp 17–18.

Rüttinger, Lukas and Alexander Carius 2013: Umwelt, natürliche Ressourcen, Konflikt, Fragilität und Gewalt in der deutschen bilateralen Entwicklungszusammenarbeit. Berlin: Adelphi.

Rüttinger, Lukas; Arne Janßen; Christopher Knupp and Laura Griestop 2014: From conflict to collaboration in natural resource management: A handbook and toolkit for practitioners working in aquatic resource systems. Manual. Collaborating for Resilience. Retrieved 08 Apr 2015, from *http://pubs.iclarm.net/resource_centre/Ruttinger.et.al.2014.From.conflict.to.collaboration.manual.pdf*.

Rüttinger, Lukas and Achim Maas 2010: Water vulnerability map. Analytical framework. Berlin: Initiative for Peacebuilding–Early Warning Analysis to Action (IfP-EW).

Rüttinger, Lukas; Antoine Morin; Annabelle Houdret; Dennis Tänzler and Clementine Burnley 2011a: Water, crisis and climate change assessment framework. Berlin: Adelphi.

Rüttinger, Lukas; Dennis Tänzler; Paddy Musana; Narcisio and Bangirana 2011b: Water crisis and climate change in Uganda: a policy brief. Retrieved 10 Dec 2014, from *http://www.adelphi.de/files/uploads/andere/pdf/application/pdf/stargo_overview_policy_brief_adelphi.pdf*.

Rüttinger, Lukas and Stephan Wolters 2014: Ein Rohstoffrausch in der Arktis? Geopolitik, Klimawandel und ein neuer unabhängiger Staat. In: Rundbrief Forum Umwelt & Entwicklung II:2, pp 15–16.

Sachs, Ram 2012: On bread and circuses: food subsidy reform and popular opposition in Egypt. Stanford, CA: Center for International Security and Cooperation, Stanford University.

Saferworld 2011: Conflict sensitive approaches to local climate change adaptation in Nepal. Retrieved 27 Mar 2015, from *http://www.saferworld.org.uk/resources/view-resource/700-conflict-sensitive-approaches-to-local-climate-change-adaptation-in-nepal*.

Sagawa, Toru 2010: Local potential for peace: trans-ethnic cross-cutting ties among the Daasanech and their neighbors. In: Echi-Gabbert, Christina; Thubauville, Sophia (eds.): To live with others: Essays on cultural neighborhood in Southern Ethiopia. Cologne: Rüdiger Köppe Verlag.

Saha, Sujan 2011: Security implications of climate refugees in urban slums: a case study from Dhaka, Bangladesh. In: Scheffran, Jürgen; Brzoska, Michael; Brauch, Hans Günter; Peter Michael Link; Janpeter Schilling (eds.): Climate change, human security and violent conflict: challenges for societal stability. Berlin: Springer.

Sandbhor, Jinda 2014: Piped water or water in river: conflict over urban drinking water vs rural livelihoods in Maval, Maharashtra. In: Joy, K. J.; Paranjape, Suhas; Bhagat, Sarita (eds.): Conflicts around domestic water and sanitation in India. Cases, issues and prospects. Pune: Forum for Policy Dialogue on Water Conflicts in India.

Schaefer, Stefan; Harald Stelzer; Wanda Born and Mark Lawrence, forthcoming: Removing greenhouse gases from the atmosphere and reflecting sunlight away from Earth. An assessment from a European perspective. Graz: European Transdisciplinary Assessment of Climate Engineering (EuTRACE).

Schalatek, Liane; Smita Nakhooda and Charlene Watson 2014: The Green Climate Fund. Climate finance fundamentals. Washington, DC and London: Heinrich Böll Stiftung North America and ODI.

Schellhase, John 2013: A subtle engagement: Ethiopia and India. Retrieved 05 Aug 2014, from *http://www.consultancyafrica.com/index.php?option=com_content&view=article&id=1325:a-subtle-engagement-ethiopia-and-india&catid=58:asia-dimension-discussion-papers&Itemid=264*.

Schilling, Janpeter 2012: On rains, raids and relations: a multimethod approach to climate change, vulnerability, adaptation and violent conflict in Northern Africa and Kenya. Hamburg: University of Hamburg.

Schilling, Janpeter; Moses Akuno; Jürgen Scheffran and Thomas Weinzierl 2014: On raids and relations: climate change, pastoral conflict and adaptation in North-Western Kenya. In: Bob, Urmilla; Bronkhorst, Salomé (eds.): Conflict-sensitive adaptation to climate change in Africa. Berlin: Berliner Wissenschaftsverlag.

Schilling, Janpeter; Janani Vivekananda; Pandey Nisha and Moazzam Ali Khan 2013: Vulnerability to environmental risks and effects on community resilience in mid-west Nepal and south-east Pakistan. In: Environment and Natural Resources Research 3:4, pp 1–19.

Schmeier, Susanne and Sabine Schulze 2012: Governing environmental change in international river basins. The role of river basin organizations. In: International Journal of River Basin Management 10:3, pp 229–244.

Schröder, Tim 2013: The future of fish - the fisheries of the future. World Ocean Review. Berlin: maribus.

Seneviratne, Sonia and Neville Nicholls 2012: Changes in climate extremes and their impacts on the natural physical environment. In: IPCC (ed.): Managing the risks of extreme events and disasters to advance climate change adaptation. Cambridge: Cambridge University Press.

Seto, Karen 2011: Sierra Leone's seas: A project to assess the current status and potential role of marine resources in the development and peacebuilding of Sierra Leone. San Diego: AWIS/CMBC/IICAS/UNEP.

Sevastopulo, Demetri and Roel Landingin 2014: China rejects Philippines case on 'nine-dash' line. Retrieved 08 Apr 2015, from *http://www.ft.com/intl/cms/s/0/dc3896ce-b7ac-11e3-80ef-00144feabdc0.html#axzz3Wi8ikw87*.

Shams, Shamil 2011: Flooded Thai residents protest against 'discrimination'. Retrieved 26 Mar 2015, from *http://www.dw.de/flooded-thai-residents-protest-against-discrimination/a-6659110*.

Sharma, Vigya and Graeme Hugo: Exploring the population-environment nexus: understanding climate change, environmental degradation and migration in Bangladesh. Marrakech, 2009.

Sidibé, Kalilou 2012: Security management in Northern Mali: criminal networks and conflict resolution. Brighton: Institute of Development Studies.

Simmons, Emmy 2013: Harvesting peace: food security, conflict and cooperation. Washington, DC: Woodrow Wilson International Center for Scholars.

Skeldon, Ronald 2002: Migration and poverty. In: Asia-Pacific Population Journal 17:4, pp 67–82.

Smith, Dan and Janani Vivekananda 2009: Climate change, conflict and fragility: understanding the linkages, shaping effective responses. London: International Alert.

Standing, Andre 2012: Corruption and REDD+: identifying risks amid complexity. Bergen: Anti-corruption Resource Centre.

Stanfield, J. D.; Jennifer Brick Murtazashvili; Safar, M.Y. and Akram Salam 2013: Community documentation of land tenure and its contribution to state-building in Afghanistan. In: Unruh, John; Williams, Rhodri (eds.): Land and post-conflict peacebuilding. Oxon: Routledge/Earthscan.

Steffen, Will; Katherine Richardson; Johan Rockström; Sarah E. Cornell; Ingo Fetzer; Elena M. Bennett; Reinette Biggs; Stephen R. Carpenter; Wim de Vries; Cynthia A. de Wit; Carl Folke; Dieter Gerten; Jens Heinke; Georgina M. Mace; Linn M. Persson; Veerabhadran Ramanathan; Belinda Reyers; Sverker Sörlin 2015: Planetary boundaries: guiding human development on a changing planet. In: Science 347:6223.

Stephen, Monica 2014: Fragile reforms: World Bank and Asian Development Bank financing in fragile and conflict-affected situations. London: International Alert.

Stepputat, Finn and Lars Engberg-Pedersen 2008: Fragile states: definitions, measurements and processes. In: Engberg-Pedersen, Lars; Andersen, Louise; Stepputat, Finn; Dietrich Jung (eds.): Fragile situations. Background paper. Copenhagen: DIIS.

Stepputat, Finn and Lauren Greenwood 2013: Whole-of-government approaches to fragile states and situations. DIIS report 25. Copenhagen: DIIS.

Stevens, Paul; Jaakko Kooroshy; Glada Lahn and Bernice Lee 2013: Conflict and coexistence in the extractive industries. London: Chatham House.

Strategic Foresight Group 2013: Blue peace for the Nile. Mumbai: Strategic Foresight Group.

Street, A. 2012: Applying conflict-sensitive methodologies in rapid-onset emergencies. In: Humanitarian Exchange Magazine 1:54, pp n.a.

Swain, Ashok 1996: The environmental trap: the Ganges River diversion, Bangladeshi migration and conflicts in India. Uppsala: Repro-C.

Swain, Ashok 2011: Challenges for water sharing in the Nile basin: changing geo-politics and changing climate. In: Hydrological Sciences Journal 56:4, pp 687–702.

Swain, Ashok 2013: Sharing Indus River for development and peace. Brussels: International Human Rights Association of American Minorities.

Tacoli, C. 2009: Crisis or adaptation? Migration and climate change in a context of high mobility. London, 24–25 June: prepared for Expert Group Meeting: Population Dynamics and Climate Change, United Nations Population Fund and International Institute for Environment and Development.

Takana, Yousif 2008: The politics of local boundaries and conflict in Sudan: the South Darfur case. Bergen: Chr. Michelsen Institute.

Tänzler, Dennis; Alexander Carius and Achim Maas 2013a: The need for conflict-sensitive adaptation to climate change. In: Dabelko, Geoffrey D.; Herzer, Lauren; Null, Schuyler; Meaghan Parker; Russell Sticklor (eds.): Backdraft: the conflict potential of climate change adaptation and mitigation. Washington, DC: Woodrow Wilson International Center for Scholars.

Tänzler, Dennis; Achim Maas and Alexander Carius 2010: Climate change adaptation and peace. In: Wiley Interdisciplinary Reviews: Climate Change 1:5, pp 741–750.

Tänzler, Dennis; Till Mohns and Katherina Ziegenhagen 2013b: Adaptation to climate change for peace and stability. Strengthening of approaches and instruments as well as promotion of processes to reduce the security risks posed by climate change in the context of climate change adaptation. Dessau: Federal Environment Agency (Umweltbundesamt).

Tänzler, Dennis and Felix Ries 2012: International climate change policies: the potential relevance of REDD+ for peace and stability. In: Scheffran, Jürgen; Brzoska, Michael; Brauch, Hans Günter; Peter Michael Link; Janpeter Schilling (eds.): Climate change, human security and violent conflict - challenges for societal stability. Berlin: Springer.

Tänzler, Dennis and Meike Westerkamp 2010: Rohstoffkonflikte nachhaltig vermeiden: Konfliktrisiken bei Zugang und Nutzung von Rohstoffen (Teilbericht 1). Berlin: Adelphi; Wuppertal Institut für Klima, Umwelt, Energie.

Teskey, Graham; Sabina Schnell and Alice Poole 2012: Beyond capacity – addressing authority and legitimacy in fragile states. Retrieved 08 Apr 2015, from *http://siteresources.worldbank.org/PUBLICSECTORANDGOVERNANCE/Resources/285741-1343934891414/8787489-1347032641376/GettingBeyondCapacity.pdf*.

Thai Health 2012: Flood of the century: warning of things to come. Retrieved 08 Apr 2015, from *http://www.hiso.or.th/hiso/picture/reportHealth/ThaiHealth2012/eng2012_14.pdf*.

Thaler, Kai M. 2013: Brazil, biofuels, and food security in Mozambique. In: Modi, Renu; Cheru, Fantu (eds.): Agricultural development and food security in Africa: the impact of Chinese, Indian and Brazilian investments. London: Zed Books.

Thatte, Chandrakant D. 2008: Indus waters and the 1960 treaty between India and Pakistan. In: Varis, Olli; Biswas, AsitK; Tortajada, Cecilia (eds.): Management of transboundary rivers and lakes. Berlin: Springer.

Thomas, Mark Roland; Gregory Smith; Ferreira, Francisco H. G.; David Evans; Maryla Maliszewska; Marcio Cruz; Kristen Himelein and Mead Over 2015: The economic impact of Ebola on sub-Saharan Africa : updated estimates for 2015. Washington, DC: World Bank Group.

Tse-ring, Karma; Eklabya Sharma; Nakul Chettri und Arun B. Shrestha (eds.) 2010: Climate change vulnerability of mountain ecosystems in the Eastern Himalayas. Kathmandu: International Centre for Integrated Mountain Development; MacArthur Foundation.

Tsounta, Evridiki and Anayochukwu Osueke 2014: What is behind Latin America's declining income inequality? Washington: IMF.

Tully, Andy 2015: Low prices help Arctic avoid a 'gold rush' scenario. Retrieved 08 Apr 2015, from *http://oilprice.com/Energy/Oil-Prices/Low-Prices-Help-Arctic-Avoid-A-Gold-Rush-Scenario.html*.

Tunstall, Sylvia; Sue Tapsell; Colin Green; Peter Floyd and Carolyn George 2006: The health effects of flooding: social research results from England and Wales. In: Journal of Water and Health 4:3, pp 365–380.

Turner, Andrew and H. Annamalai 2012: Climate change and the South Asian summer monsoon. In: Nature Climate Change 2:1, pp 587–595.

Tuttle, Aliza 2014: Principle capital holdings biofuel project in Dombe, Mozambique. Retrieved 10 Feb 2015, from *http://ejatlas.org/conflict/principle-capital-holdings-biofuel-project-in-dombe-mozambique*.

Twerefou, D. K. 2009: Mineral exploitation, environmental sustainability and sustainable development in EAC, SADC and ECOWAS regions. Addis Ababa: African Trade Policy Centre.

UK MoD 2014: Strategic trends programme: global strategic trends - out to 2045. Shrivenham: UK Ministry of Defence.

UN Development Group and World Bank 2007: Joint guidance note on integrated recovery planning using post conflict needs assessments and transitional results frameworks. Retrieved 28 Nov 2014, from *https://docs.unocha.org/sites/dms/Documents/Joint%20Guidance%20Note%20on%20Integrated%20Recovery%20Planning.pdf*.

UN Habitat 2013: Streets as public spaces and drivers of urban prosperity. Nairobi: United Nations Human Settlements Programme.

UN Secretary-General 2009: Climate change and its possible security implications: report of the Secretary-General. Retrieved 08 Apr 2015, from *http://www.un.org/esa/dsd/resources/res_pdfs/ga-64/SGReport_on_climate_change_and_security.pdf*.

UN System Chief Executives Board for Coordination 2008: Acting on climate change: the UN system delivering as one. New York: United Nations.

UN WCDRR 2015: Sendai Framework for Disaster Risk Reduction 2015–2030. A/CONF.224/CRP.1. Retrieved 08 Apr 2015, from *http://www.wcdrr.org/uploads/Sendai_Framework_for_Disaster_Risk_Reduction_2015-2030.pdf*.

UN WomenWatch 2009: Women, gender equality and climate change. Retrieved 16 Feb 2015, from *http://www.un.org/womenwatch/feature/climate_change/downloads/Women_and_Climate_Change_Factsheet.pdf*.

UNCCD 2014a: Land degradation neutrality. Resilience at local, national and regional levels. Bonn: United Nations Convention to Combat Desertification (UNCCD).

UNCCD 2014b: The land in numbers. Livelihoods at a tipping point. Bonn: UNCCD.

UN-DESA 2011: The global social crisis. Report on the world social situation 2011. New York: UN-DESA.

UN-DESA 2014: World urbanization prospects: The 2014 revision. New York: United Nations.

UNDP 1994: Human development report 1994. New York: Oxford University Press.

UNDP 2011: Disaster - conflict interface - comparative experiences. New York: UNDP Bureau for Crisis Prevention and Recovery.

UNDP 2012a: Preventing crisis, enabling recovery: BCPR annual report 2011. Bureau for Crisis Prevention and Recovery. Retrieved 08 Apr 2015, from *http://www.undp.org/content/dam/undp/library/crisis%20prevention/BCPRAR2011_final.pdf*.

UNDP 2012b: Reducing vulnerability to climate change by establishing early warning and disaster preparedness systems and support for integrated watershed. Rwanda case study. New York: UNDP.

UNDP 2013a: Human development report 2013: the rise of the South. Human progress in a diverse world. New York: UNDP.

UNDP 2013b: Preventing crisis enabling recovery. A review of UNDP's work in conflict and disaster-affected countries: 2012. Retrieved 08 Apr 2015, from *http://www.undp.org/content/dam/undp/library/crisis%20prevention/BCPR_isuu-sm.pdf*.

UNDP 2014: Preventing crisis enabling recovery. 2013 in review: UNDP's work in countries affected by conflict and disaster. Retrieved 08 Apr 2015, from *http://www.undp.org/content/dam/undp/library/crisis%20prevention/UNDP_CPR_Annualreport2013.pdf*.

UNDP-ALM 2014: Supporting LDCs to advance National Adaptation Plans (NAPs). Retrieved 08 Apr 2015, from *http://www.undp-alm.org/projects/naps-ldcs/country-initiatives*.

UNDP-UNEP 2011: Mainstreaming poverty-environment linkages into development planning: a handbook for Practitioners. New York: UNDP-UNEP.

UNEP 2007: Sudan: post-conflict environmental assessment. Nairobi: United Nations Environment Program (UNEP).

UNEP 2009: From conflict to peacebuilding. The role of natural resources and the environment. Nairobi: UNEP.

UNEP 2011a: Drought and potential conflict scenarios in Northern Kenya and other arid lands. A Situational Report. In: Situation Report 1:1, pp 1–6.

UNEP 2011b: Livelihood security, climate change, migration and conflict in the Sahel. Geneva: UNEP.

UNEP 2012a: Global environment outlook GEO 5. Environment for the future we want. Nairobi: UNEP.

UNEP 2012b: Policy implications of warming permafrost. Retrieved 08 Apr 2015, from *http://www.unep.org/pdf/permafrost.pdf*.

UNEP 2013: Natural resource management and peacebuilding in Afghanistan. Nairobi: UNEP.

UNEP 2014a: Environmental cooperation for peacebuilding. Retrieved 08 Apr 2015, from *http://www.unep.org/disastersandconflicts/Introduction/EnvironmentalCooperationforPeacebuilding/tabid/54355/Default.aspx*.

UNEP 2014b: Environmental cooperation for peacebuilding. A closer look. Retrieved 08 Apr 2015, from *http://www.unep.org/disastersandconflicts/Introduction/EnvironmentalCooperationforPeacebuildingDetail/tabid/54643/Default.aspx*.

UNEP 2014c: The adaptation gap report. A preliminary assessment. Nairobi: UNEP.

UNEP and Convention on Biological Diversity 2012: Impacts of climate-related geoengineering on biological diversity. Retrieved 05 Dec 2014, from *http://www.cbd.int/doc/meetings/sbstta/sbstta-16/information/sbstta-16-inf-28-en.pdf*.

UNEP; Environmental Law Institute; McGill University and The University of Tokyo 2014: Post-conflict peacebuilding and natural resource management. Retrieved 18 Feb 2015, from *http://postconflict.unep.ch/publications/UNEP_ECP_brochure_PCNRM.pdf*.

UNEP and OCHA 2014: Environment and humanitarian action, increasing effectiveness, sustainability and accountability. Geneva: Joint UNEP/OCHA Environment Unit.

UNEP; UNDP; NATO and OSCE 2005: Environment and security transforming risks into cooperation - Central Asia Ferghana / Osh / Khujand area. Retrieved 11 Feb 2015, from *https://www.iisd.org/pdf/2004/envsec_transforming_risk_en.pdf*.

UNFCCC 2005: Climate change, small island developing states. Bonn: Climate Change Secretariat (UNFCCC).

UNFCCC 2011: Report of the Conference of the Parties on its sixteenth session, held in Cancun from 29 November to 10 December 2010. Retrieved 16 Mar 2015, from *http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf*.

UNFCCC 2014a: Building resilience in a changing climate: adaptation under the UNFCCC. Retrieved 15 Mar 2015, from *http://unfccc.int/timeline/*.

UNFCCC 2014b: Good practices in and lessons learned from national adaptation planning. Submissions from Parties and Nairobi work programme partner organizations. Subsidiary body for scientific and technological advice, forty-first session, Lima, 1–6 December 2014, item 3 of the provisional agenda "Nairobi work programme on impacts, vulnerability and adaptation to climate change". Retrieved 08 Apr 2015, from *http://unfccc.int/resource/docs/2014/sbsta/eng/misc08.pdf*.

UNFCCC 2014c: NAPAs received by the secretariat. Retrieved 16 Mar 2015, from *http://unfccc.int/adaptation/workstreams/national_adaptation_programmes_of_action/items/4585.php*.

UNFCCC 2014d: Status of NAPA implementation under the LDCF (as of 19 March 2014). Retrieved 08 Apr 2015, from *http://unfccc.int/adaptation/knowledge_resources/ldc_portal/items/5632.php*.

UNHCR 2015: 2015 UNHCR country operations profile - Jordan. Retrieved 18 Feb 2015, from *http://www.unhcr.org/pages/49e486566.html*.

UNICEF 2012: Gender and water, sanitation and hygiene (WASH). Retrieved 10 Feb 2015, from *http://www.unicef.org/esaro/7310_Gender_and_WASH.html*.

UNISDR 2014: Progress and challenges in Disaster Risk Reduction: a contribution towards the development of policy indicators for the Post-2015 Framework on Disaster Risk Reduction. Retrieved 27 Mar 2015, from *http://www.wcdrr.org/documents/wcdrr/prepcom1/Indicator%20system%20for%20Post%202015%20Framework%20June%202015_v2.pdf*.

UNISDR 2015: Terminology. Retrieved 08 Apr 2015, from *http://www.unisdr.org/we/inform/terminology*.

United Nations 1992: United Nations Framework Convention on Climate Change. Retrieved 08 Apr 2015, from *http://unfccc.int/resource/docs/convkp/conveng.pdf*.

United Nations 2010: UN Special Rapporteur on the right to food: Mission to Syria from 29 August to 7 September 2010. Retrieved 10 Jan 2015, from *http://www2.ohchr.org/english/issues/food/docs/SyriaMissionPreliminaryConclusions_07092010.pdf*.

United Nations 2015: Status of the Convention on the Law of the Non-Navigational Uses of International Watercourses. Retrieved 20 Apr 2015, from *https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-12&chapter=27&lang=en*.

United Nations and World Bank 2014: Fragility and conflict partnership trust fund. Annual report 2014. Retrieved 08 Apr 2015, from *http://pubdocs.worldbank.org/pubdocs/publicdoc/2014/10/164151412688980019/UN-WB-TF-Annual-Report-web2014.pdf*.

United Nations Peacebuilding Fund 2014: Investing in peace 2013. Annual report of the administrative agent of the Peacebuilding Fund. Retrieved 08 Apr 2015, from *http://www.unpbf.org/wp-content/uploads/UN-PBF-Annual-Report-2013.pdf*.

UNODC 2011: Independent external review of the UNPFN. Final report. Retrieved 08 Apr 2015, from *http://www.unpbf.org/wp-content/uploads/UNPFN-Review-Final-Report-110902-Final.pdf*.

UNODC 2013: Global study on homicide. Trends, contexts, data. Retrieved 11 Feb 2015, from *http://www.unodc.org/documents/gsh/pdfs/2014_GLOBAL_HOMICIDE_BOOK_web.pdf*.

UNPFN 2013: Fact sheet. Retrieved 08 Apr 2015, from *http://mdtf.undp.org/document/download/7644*.

UNRIC 2009: With hunger rising, food emerges as key to security, poverty and climate. Retrieved 16 Mar 2015, from *http://www.unric.org/html/english/library/UNinFocus/no2.pdf*.

UNSC 2007: Security Council 5663rd meeting (S/PV.5663). Retrieved 16 Mar 2015, from *http://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/CC%20SPV%205663.pdf*.

UNSC 2011: Statement by the President of the Security Council (S/PRST/2011/15). Retrieved 16 Mar 2015, from *http://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4F-F96FF9%7D/CC%20SPRST%202011%205.pdf*.

UN-Water 2007: Coping with water scarcity: challenge of the twenty-first century. Geneva: United Nations.

UN-Water 2008: Transboundary waters: Sharing benefits, sharing responsibilities. Retrieved 10 Dec 2014, from *http://www.unwater.org/downloads/UNW_TRANSBOUNDARY.pdf*.

UN-Water 2014: Statistics. Retrieved 24 Jul 2014, from *http://www.unwater.org/statistics/statistics-detail/en/c/211760/*.

Uppsala Conflict Data Program 2014: Mauritania. Retrieved 08 Apr 2015, from *http://www.ucdp.uu.se/gpdatabase/gpcountry.php?id=105&regionSelect=1-Northern_Africa*.

Uprety, Dharam R.; Harisharan Luintel and Kamal Bhandari 2011: REDD+ and conflict. A case study of the REDD + projects in Nepal. Retrieved 10 Dec 2014, from *http://www.forestaction.org/app/webroot/js/tinymce/editor/plugins/filemanager/files/REDD-conflict_Report%20Dharam.pdf*.

Uprety, Kishor 2014: A South Asian perspective on the UN Watercourses Convention. Retrieved 16 Mar 2015, from *http://www.internationalwaterlaw.org/blog/2014/07/14/dr-kishor-uprety-a-south-asian-perspective-on-the-un-watercourses-convention/*.

Urdal, Henrik 2008: Population, resources, and political violence. In: Journal of Conflict Resolution 52:4, pp 590–617.

Urdal, Henrik 2012: A clash of generations? Youth bulges and political violence. New York: UN-DESA.

Urdal, Henrik and Kristian Hoelscher 2009: Urban youth bulges and social disorder. An empirical study of Asian and Sub-Saharan African cities. Washington D.C.: World Bank.

US Department of Homeland Security 2008: DHS risk lexicon. Washington, DC: US Department of Homeland Security.

US Geological Survey 2008: Circum-Arctic resource appraisal: estimates of undiscovered oil and gas north of the Arctic circle. Retrieved 09 Jan 2015, from *http://pubs.usgs.gov/fs/2008/3049/*.

US NIC 2012: Global trends 2030: alternative worlds. Retrieved 09 Jan 2015, from *https://globaltrends2030.files.wordpress.com/2012/11/global-trends-2030-november2012.pdf*.

USAID 2006: Central America and Dominican Republic Quality Coffee Program (CADR QCP). Washington: United States Agency for International Development (USAID).

USAID 2010: Haiti country profile - property rights & resource governance. Retrieved 18 Feb 2015, from *http://usaidlandtenure.net/sites/default/files/country-profiles/full-reports/USAID_Land_Tenure_Haiti_Profile.pdf*.

USAID 2012a: Building resilience to recurrent crisis: USAID policy and program guide. Washington, DC: USAID.

USAID 2012b: Conflict assessment framework 2.0. Washington, DC:USAID.

USAID 2012c: Follow the water: emerging issues of climate change and conflict in Peru. Washington, DC: USAID.

USAID 2014a: Climate-resilient development. A framework for understanding and addressing climate change. Washington, DC: USAID.

USAID 2014b: Global alliance for action for drought resilience & growth. Retrieved 15 Jan 2015, from *http://globalallianceforaction.com/: U.S. Agency for International Development*.

USAID 2014c: Mali climate vulnerability mapping. African and Latin American resilience to climate change (ARCC). Retrieved 11 Feb 2015, from *http://www.ciesin.org/documents/Mali-CV-Mapping.pdf*.

USAID 2015: Climate change and conflict: an annex to the USAID climate-resilient development framework. Washington, DC: USAID.

Valdes, Constanza 2011: Brazil's ethanol industry: looking forward. Retrieved 09 Dec 2015, from *http://www.ers.usda.gov/media/126865/bio02.pdf*.

Verité 2013: Risk analysis of indicators of forced labor and human trafficking in illegal gold mining in Peru. Retrieved 26 Mar 2015, from *http://www.verite.org/sites/default/files/images/Indicators%20of%20Forced%20Labor%20in%20Gold%20Mining%20in%20Peru_0.pdf*.

Vivekananda, Janani 2011: Practice note - conflict-sensitive responses to climate change in South Asia. London: International Alert.

Vivekananda, Janani; Dan Smith and Janpeter Schilling 2014: Understanding resilience in climate change and conflict affected regions of Nepal. In: Geopolitics 19:4, pp 911–936.

Waizenegger, A. and J. Hyndman 2010: Two solitudes: post-tsunami and post-conflict Aceh. In: Disasters 34:3, pp 787–808.

Waldman, Matt 2008: Community peacebuilding in Afghanistan: the case for a national strategy. London: Oxfam.

Wamugi, Isaac and Julius Muchemi 2011: Strengthening community managed drought risk reduction in Northern Kenya and Southern Ethiopia. Nairobi: European Commission; Cooperazione Internazionale.

Watts, Robbie 2012: Managing climate change and conflict in Mali. Retrieved 15 Feb 2015, from *https://www.ids.ac.uk/files/dmfile/LHcasestudy13-Mali.pdf*.

WBGU 2007: World in transition. Climate change as a security risk. Berlin: German Advisory Council on Global Change WBGU.

Weir, Tony and Zahira Virani 2010: Three linked risks for development in the Pacific Islands: climate change, natural disasters and conflict. Suva: The University of the South Pacific, Pacific Centre for Environment and Sustainable Development.

Welton, George 2011: The impact of Russia's 2010 wheat export ban. Oxford: Oxfam.

Werrell, Caitlin E. und Francesco Femia (eds.) 2013: The Arab Spring and climate change: a climate and security correlations series. Washington, DC: Center for American Progress.

Werz, Michael and Laura Conley 2012: Climate change, migration, and conflict: addressing complex crisis scenarios in the 21st century. Washington, DC: Center for American Progress.

WFP 2013: The status of poverty and food security in Egypt: Analysis and policy recommendations. Preliminary Summary Report. Cairo: WFP.

WFP 2015: How climate change affects hunger. Retrieved 08 Apr 2015, from *http://www.wfp.org/climate-change*.

WFP and Met Office 2012: Climate impacts on food security and nutrition. A review of existing knowledge. Exeter: WFP; Met Office, Hadley Centre for Climate Prediction and Research.

Wheeler, David 2011: Quantifying vulnerability to climate change: implications for adaptation assistance. CGD working paper 240. Washington, DC: Center for Global Development (CDG).

White House 2014: Executive order - climate-resilient international development. Retrieved 08 Apr 2015, from *https://www.whitehouse.gov/the-press-office/2014/09/23/executive-order-climate-resilient-international-development*.

Whiteman, Gail; Chris Hope and Peter Wadhams 2013: Vast cost of Arctic change. In: Nature 499:1, pp 401–403.

Whittington, Dale; John Waterbury and Marc Jeuland 2014: The Grand Renaissance Dam and prospects for cooperation on the Eastern Nile. In: Water Policy 16:4, pp 595–608.

Wilson, Emma und Emma Blackmore (eds.) 2013: Dispute or dialogue? Community perspectives on company-led grievance mechanisms. London: International Institute for Environment and Development (IIED).

WMO 2005: Climate and land degradation. Geneva: World Meteorological Organization (WMO).

Wolf, Aaron 1999: Water and human security (AVISO 3). Victoria, BC: The Global Environmental Change and Human Security Project.

Wolf, Aaron T.; Shira B. Yoffe and Mark Giordano 2003: International waters: indicators for identifying basins at risk. In: Water Policy 5:1, pp 29–60.

World Bank 2010: Egypt's food subsidies: benefit incidence and leakages. Washington, DC: World Bank

World Bank 2011: World Development Report 2011. Conflict, security and development. Washington, DC: World Bank.

World Bank 2013: Special themes for IDA17: IDA resource mobilization department - concessional finance and global partnerships. Washington, DC: International Development Association (IDA).

World Bank 2014a: Commodity markets outlook October 2014. Retrieved 24 Nov 2014, from *http://www.worldbank.org/content/dam/Worldbank/GEP/GEPcommodities/commodity_markets_outlook_2014_october.pdf*.

World Bank 2014b: Myanmar: Rice price volatility and poverty reduction. Retrieved 16 Feb 2015, from *http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2014/11/24/000470435_20141124091447/Rendered/PDF/896870WP0P14490rty0Reduction0Report.pdf*.

World Bank 2014c: Urban development overview. Retrieved 09 Jan 2015, from *http://www.worldbank.org/en/topic/urbandevelopment/overview*.

World Bank 2014d: Commitments, IBRD /IDA. Retrieved 21 Dec 2014, from *http://data.worldbank.org/indicator*.

World Bank 2015a: Climate change knowledge portal. Egypt. Retrieved 30 Mar 2015, from *http://sdwebx.worldbank.org/climateportal/*.

World Bank 2015b: Commodity markets outlook. Retrieved 18 Feb 2015, from *http://www.worldbank.org/content/dam/Worldbank/GEP/GEPcommodities/GEP2015a_commodity_Jan2015.pdf*.

World Bank 2015c: World development report 2015: mind, society, and behavior. Washington, DC: World Bank.

World Economic Forum 2012: New models for addressing supply chain and transport risk. An initiative of the risk response network in collaboration with Accenture. Retrieved 10 Feb 2015, from *http://www3.weforum.org/docs/WEF_SCT_RRN_NewModelsAddressingSupplyChainTransportRisk_IndustryAgenda_2012.pdf*.

World Economic Forum 2014: Global risks 2014. Geneva: World Eocnomic Forum.

World Economic Forum 2015: Global risks 2015. 10th edition. Geneva: World Economic Forum.

WWF 2012: How many species are we losing? Retrieved 09 Jan 2015, from *http://wwf.panda.org/about_our_earth/biodiversity/biodiversity/*.

Xie, Yu and Xiang Zhou 2014: Income inequality in today's China. In: Proceedings of the National Academy of Sciences 111:19, pp 6928–6933.

Yifu Lin, Justin 2012: Youth bulge. A demographic dividend or a demographic bomb in developing countries? Retrieved 10 Dec 2014, from *http://blogs.worldbank.org/developmenttalk/youth-bulge-a-demographic-dividend-or-a-demographic-bomb-in-developing-countries*.

Yongo, E. O.; R. O. Abila and C. Lwenya 2011: Emerging resource use conflicts between Kenyan fishermen, pastoralists and tribesmen of Lake Turkana. In: Aquatic Ecosystem Health & Management 13:1, pp 28–34.

Zarfl, Christiane; Alexander E. Lumsdon; Jürgen Berlekamp; Laura Tydecks and Klement Tockner 2015: A global boom in hydropower dam construction. In: Aquatic Sciences 77:1, pp 161–170.

Zawahri, Neda A. 2014: Refugee rehabilitation and transboundary cooperation: India, Pakistan, and the Indus River system. In: Nakayama, Mikiyasu; Troell, Jessica; Weinthal, Erika (eds.): Water and post-conflict peacebuilding. Shoring up peace. London: Earthscan.

Acknowledgements: We would like to thank our interview partners, experts, and survey participants for their time and input, and the organizations that helped us arrange our consultations — Fundación Futuro Latinoamericano (FFLA), Friends of the Earth Middle East, International Institute for Sustainable Development, and United Nations Environment Programme. We'd also like to thank the Nansen Initiative for allowing us to participate in their regional consultation.

adelphi is a Berlin-based think tank and public policy consultancy on environment, development, and foreign policy. With a staff of 130, adelphi provides high-quality interdisciplinary research and strategic policy analysis, public policy consulting and training, and facilitates dialogue for governments, development partners, and international organizations.

International Alert is Europe's leading peacebuilding organization, with almost 30 years of experience laying the foundations for peace across Asia, Africa, Eurasia, Middle East, and Latin America. It was one of the first NGOs to research, analyse, and lead innovative thinking on the security implications of climate change, particularly in fragile states.

The Wilson Center provides a strictly nonpartisan space for the worlds of policymaking and scholarship to interact. By conducting relevant and timely research and promoting dialogue from all perspectives, it works to address the critical current and emerging challenges confronting the United States and the world.

The European Union Institute for Security Studies (EUISS) is an autonomous EU agency dealing with the analysis of foreign, security, and defence policy issues. The Institute's core mission is to provide both analyses and discussion fora to enrich the formulation of EU policy, acting as an interface between European experts and decision-makers at all levels.

This report was financed by the German Federal Foreign Office, the Foreign & Commonwealth Office, the US government through USAID, the French Ministry of Foreign Affairs, and the European Union.

Federal Foreign Office

Foreign & Commonwealth Office

USAID FROM THE AMERICAN PEOPLE

Liberté • Égalité • Fraternité RÉPUBLIQUE FRANÇAISE MINISTÈRE DES AFFAIRES ÉTRANGÈRES ET DU DÉVELOPPEMENT INTERNATIONAL

PARIS2015 COP21·CMP11

www.newclimateforpeace.org