Methodology Paper

Weathering Risk aims to ensure that all relevant policies and decision-making have access to and are better informed by evidence-based analysis on climate change related security risks, now and in the future. We will identify short-, medium-, and long-term threats to peace and wellbeing, and geopolitical and diplomatic relationships.

To fulfil this objective, a multi-tiered climate and security risk and foresight assessment will be carried out by adelphi and Potsdam Institute for Climate Impact Research (PIK). The first step of *Weathering Risk* is the development of an assessment approach.[1] Its development is guided by two overarching questions:

- Through which pathways and under which circumstances will climate change affect peace and security in the short-, medium- and long-term, and how?[2]
- What concrete actions can be taken to prevent and reduce these climate-related security risks, and what capacities and resources are available or needed to implement these actions in different contexts?

Ensuring that we look forwards, not just back, *Weathering Risk* combines state-of-the-art quantitative and qualitative assessments and scenario-based foresight methods in an innovative way. The aim is to identify risks and prioritise entry points for action to promote sustainable peace and prevent the emergence and escalation of conflict linked to climate change impacts. Specifically, this assessment methodology will:

- Integrate quantitative and qualitative methods to climate-security analysis;
- Include innovative climate impact data, conflict analysis and scenario methods;
- Be flexible in application in terms of geography and depth of analysis, and
- Be forward looking.

Our approach consists of five steps:

1. Climate impact analysis
2. Contextual analysis of climate-related security risks
3. Foresight and scenario planning: consultations and expert judgement elicitation
4. Machine Learning based assumption testing and validation process
5. Identification of responses

[1] In the following document the terms approach and methodology are used interchangeably.

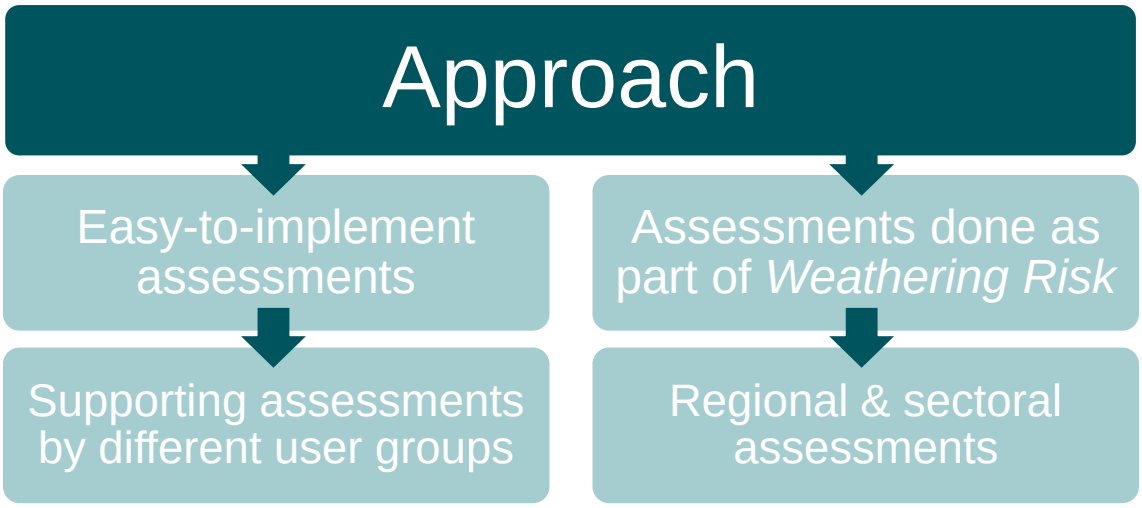
[2] We consider short-term to be 0-4 years, medium-term to be 5-10 years and long-term to be 10-30 years.

The approach will be replicable. We will also ensure that its core elements will be usable for a broad range of stakeholders. For a select number of stakeholders, we will develop specific documents and tools that integrate directly into existing tools and processes, e.g. the UN Common Country Assessments.

1. Aims

Our approach will serve two broad purposes: 1.) to enable and guide *Weathering Risk*'s own risk assessments; and 2.) to serve as a resource for other stakeholders to conduct and inform their respective assessments (see figure 1 plus use cases and user groups below).

Figure 1: Two Track Methodology

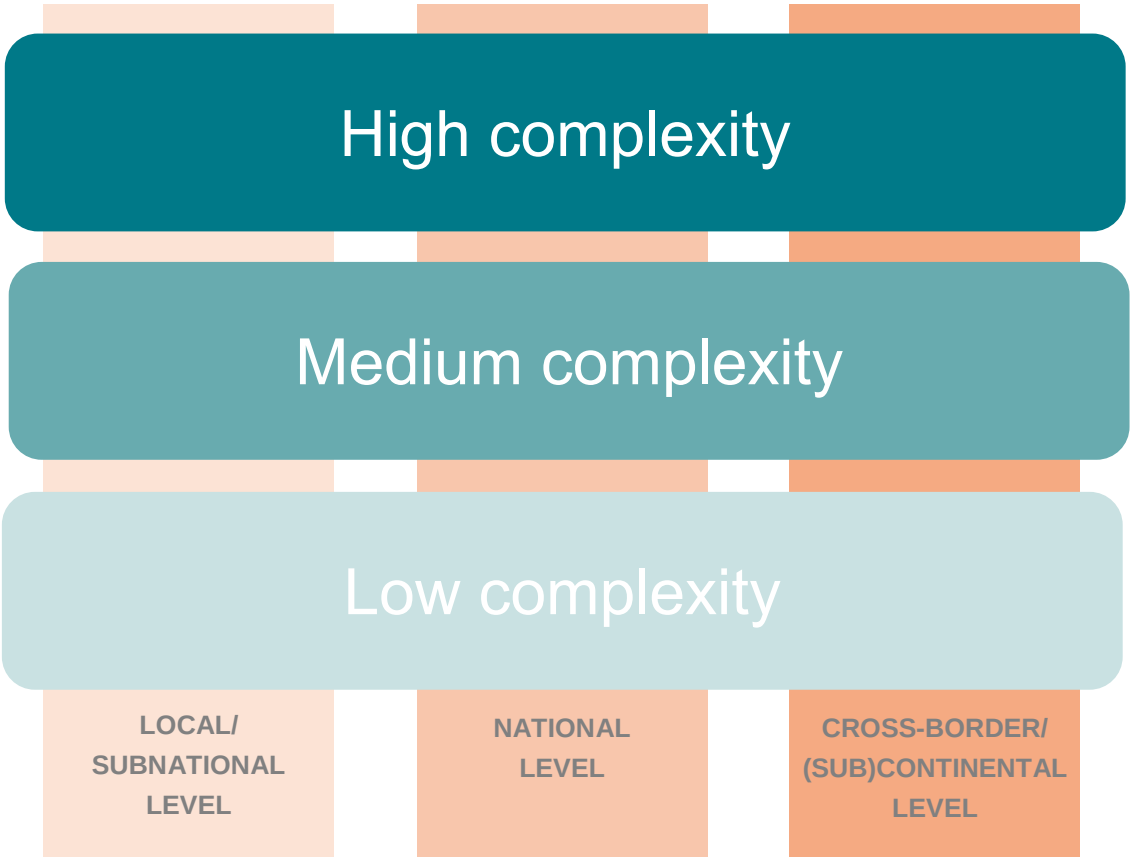


In order to be usable by a broad range of stakeholders, the approach will be flexible across different geographical scales and for different time and resource availabilities for assessments. Different stakeholders will have different requirements regarding the speed of assessment and how much time and resources can be invested in order to attain good results. The geographic interest and scope of stakeholders will also vary. Therefore, the approach needs to allow for differing depths of research and complexity. Our aim is to provide a three-tiered approach (low, medium and high complexity, and necessary time commitment). Second, the approach will also be adaptable to different scales in terms of geography. We aim to produce an assessment approach that can cover the local/subnational, national and cross-border/(sub)continental level.

The approach will support both risk assessment and risk management. This means that it will need to enable the user to:

- Identify and understand current and future climate-related security risks;
- Assess and understand current and future dimensions of resilience against climate-related security risks;
- Identify possible entry points and response measures, including existing capacities and needs for effective responses.

Figure 1: Possible combinations of methodology scales and complexity



2. Use Cases

Our approach and subsequent outputs are targeted at the following use cases and user groups:

1. **Enabling and informing national, sub-national and international policymaking for climate security**
   Indicative users: National ministries, national or sub-national planning and specialised agencies, decision makers and high-level representatives (all in both recipient and donor countries); international organisations, international planning and specialised agencies.

2. **Supporting UN analyses and planning processes such as the CSM assessments, Climate Change Risk Management Framework and Common Country Assessments**
   Indicative users: Working level staff at UN HQ, country offices and missions, UN agencies and bodies, especially UNEP, UNDP, DPPA, UN Country Offices, UN regional bodies and UN peacekeeping bodies (DPO; PBC; PBF); integration of climate security into resident coordinator handbooks.

3. **Adding climate dimensions to peacebuilding and humanitarian interventions and informing peace programming**
   Indicative users: Working level staff at UN HQ and country offices, UN agencies and bodies, especially DPPA, UN Country Offices, UN peacekeeping bodies (DPO; PBC;

PBF); humanitarian actors at HQ and country/regional level (e.g. ICRC, OCHA, NGOs), peacebuilding organisations and implementing agencies (NGOs, etc.), climate and development finance institutions (e.g. GCF, World Bank, AfDB).

4. **Anticipating conflict, informing preventive action and aiding climate change adaptation and mitigation (CCA/M), resilience and development programming**
   Indicative users: Actors in mitigation, adaptation, resilience, and development programming and others; specifically working level staff at UN HQ and country offices, UN agencies and bodies, especially UNDP, UNEP, UN Country Offices; NGOs and implementing agencies tasked with development and CCA/M (e.g. GIZ), climate and development finance institutions (e.g. GCF, World Bank, AfDB).

Given the diversity of users and their wide-ranging needs with such an approach, our methodology operates at two levels. First, we will develop a base assessment approach which will be tested using additional methodological stages (machine learning and scenario planning) which need not be replicated, but rather serve to refine and validate the models, indicators and key pathways which underpin our analytical approach. Based on this, we will develop a range of exemplary regional and sectoral case studies. Second, building on this, we will develop an accessible methodology which can be adopted by non-experts from across all user groups. This approach will be translated into differentiated guiding documents and inputs that can be used by different types of stakeholders.

Whilst we intend for our methodology to be easily replicable at different scales and levels of complexity to suit different needs, timescales and available resources, our user mapping clearly evidenced that many potential end-users cannot or will not use a generic tool. As such, for a select number of stakeholders, bespoke documents and tools will be developed and adapted based on needs, to integrate the approach directly into existing tools and processes, e.g. regional stabilisation strategies, national adaptation plans or UN Common Country Assessments.

3. Analytical Framework

Conceptual foundations

Our analytical framework is based on the concept of *human security*. Human security is people-centred and includes economic, food, health, environmental, personal, community and political security.[3] The framework also relies on the definition of the OECD of *instability* and *fragility* as “the combination of exposure to risk and insufficient coping capacity of the state, system, and/or communities to manage, absorb, and mitigate those risks” (Desai & Forsberg, 2020). Political instability, (organised) crime, urban violence, terrorism and *violent conflict* are different ways in which insecurity manifests itself. Our framework covers all of these; however, users should be specific about which kinds of insecurity, instability and conflicts they are referring to and assessing, keep in mind that often, multiple kinds occur simultaneously and interact with each other.

[3] For all dimensions and a definition of human security see UNDP (2006) and Adger et al 2014.

Climate-related risks, including *climate-related security risks,* are driven by a range of climatic hazards including *slow onset changes* such as temperature rise, ocean acidification and changes in precipitation patterns, as well as *fast onset events* such as storms and floods. These hazards are also referred to as *climatic stressors or shocks*. The impact of these climate stressors, including on security and peace, is dependent on 1) the exposure of a certain community, economic sector, or geographic area to these hazards, and 2) its vulnerability, i.e. the degree to which geophysical, biological, and socio-economic systems are susceptible to, and unable to cope with, adverse impacts of climate change.[4]

Climate-related security risks are thus driven by one or more climatic stressors that have certain direct and/or indirect impacts on human security and challenge the peace and stability of states and societies. They are systemic risks that emerge through complex interactions between climate change and different social, economic, environmental, demographic and political factors.[5] These interactions can be clustered around a number of specific impact pathways.[6] This framework provides guidance on how to navigate this complexity and unpack these interactions and pathways.

Elements of the assessment approach

A thorough climate and security analysis covers an assessment of the following aspects:

- Climatic pressures (climate lens);
- Economic, social, and political stability, as well as existing and past drivers, dynamics, and actors of insecurity (conflict lens);
- Climate change interactions with insecurity and peace (pathways);
- Important context factors shaping vulnerability and resilience to climate and conflict risks, including gender equality and social inclusion (cross-cutting topics).

The order in which the elements are presented here does not imply an order in which the assessment has to take place. The analysis can start at any point in the framework and the different parts necessarily overlap. The overlaps underline the links between the different elements and are not meant to duplicate certain steps. It is important to cover all the elements of the analytical frameworks and assess the interactions between them. Cross-cutting elements such as gender, social inclusion and governance will be integrated across the different steps.

The pathways used in this framework are based on the best available knowledge and science in the field. They are meant as entry points and hypotheses that will be carefully assessed for every context and further tested and explored as part of *Weathering Risk*. They are not meant to limit the analysis to only these pathways.

[4]This is based on the definition of the IPCC (2018) and the conceptual approach put forward by the UN Climate Security Mechanism (2020).

[5] This follow other research projects on the topic, in particular CASCADES.

[6] See the 10 Insights on Climate Impacts and Peace for a more detailed discussion.

Climate Change Lens

What are the main current and projected climate change-related stressors?

Who is particularly exposed to climate change-related stressors?

Peace and Security Lens

What is the state of economic, social, and political stability?

What are the main drivers, dynamics, and actors of insecurity and conflict?

Who is particularly affected by insecurity and conflict?

Climate-related security risks

How do climate change impacts, stability, peace and security interact?

How does climate change affect stability and peace?

How does climate change impact drivers, dynamics, and actors of insecurity and conflict?

How does instability and insecurity affect vulnerability to climate change and resilience?

Context factors shaping vulnerability and resilience

What exacerbates climate and security risks? What mediates climate and security risks?

It is important to not just focus on the factors exacerbating risks, but also on what is making communities, societies and states resilient and peaceful.

- Gender Equality and Social Inclusion, mobility with dignity
- Social cohesion and relationships between groups
- Governance and trust in governments
- Access to livelihood opportunities and public services such as health and education
- Institutions for conflict management
- Agents of change
- Health

Possible pathways

- Natural resource competition/conflicts
- Livelihood insecurity
- Migration and displacement
- Disasters challenging governance
- Food security/prices
- International tensions
- Unintended, negative impacts of climate change and military/security policies

4. Interdisciplinary and mixed-method approach

The methodology is interdisciplinary and applies quantitative and qualitative methods across five linked and iterative steps. Quantitative methods are used to inform and validate the findings of the qualitative studies, while qualitative studies are used to inform and validate the assumptions necessary for quantitative models (theory building and hypothesis generation).

PIK, adelphi and a range of partner organisations and end users will work in an integrated manner from the beginning, bridging the quantitative and qualitative divide, and the gap between research and action on the ground.

i. Climate impact analysis

To provide the best available quantitative climate change impact data for the analysis of climate-related security risks, we draw from the data and modelling work done by PIK's Inter-Sectoral Impact Model Intercomparison Project (ISIMIP). ISIMIP provides a comprehensive and consistent picture of the world under different climate change scenarios. It synthesises the results of various global and regional impact models to better understand how climate change impacts affect different sectors such as water, agriculture or health and how impacts in different sectors interact and amplify each other.

This data will be used to inform Climate Risk Profiles which will present a concise overview of present and future climate impacts (until 2080) and risks at the national and sub-national level for relevant sectors in focus countries and/or regions where the assessment will be piloted (Lange et al., 2020a for all further information below). The methodology for these Climate Risk Profiles adopts the approach developed by AGRICA.[7]

Climate Risk Profiles[8]: Future climate impact projections are made for two future greenhouse gas emissions scenarios (Representative Concentration Pathways, RCPs) under the SSP2 socio-economic pathway. RCP2.6 represents the low emissions scenario in line with the Paris Agreement, whilst RCP6.0 represents a medium to high emissions scenario. The simulations are based on the output data of the following models:

- 4 Global Climate Models (GCMs) that simulate the physical, chemical and biological dynamics of the climate system.[9]
- 6 Global Hydrological Models (GHMs) that simulate the hydrological cycle at the land surface of continental-scale river basins.[10]

[7] AGRICA is a project implemented by PIK in cooperation with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). For more information, see agrica.de.
[8] From *Climate Risk Profiles: Supplemental Information,* Lange et al., 2020a
[9] IPSL-CM5A-LR, GFDL-ESM2M, MIROC5, HadGEM2-ES
[10] CLM45, H08, LPJmL, MPI-HM, PCR-GLOBWB, WaterGAP2

- 3 Global Gridded Crop Models (GGCMs) that simulate crop growth at the grid scale for a selected number of crops.[11]
- 3 Global Vegetation Models (GVMs) that simulate the dynamics of terrestrial vegetation and soil as well as the associated carbon pools and fluxes.[12]
- 2 Global Species Distribution Models (GSDMs) that simulate species distribution based on known locations of a species and information on environmental conditions.[13]
- 1 Temperature Related Mortality Model (TRMM) simulates excess mortality attributable to high or low temperatures.[14]

These models will be used to provide downscaled data on a 50x50km grid cell level for the following indicators:

Temperature and temperature change
Temperature change projections are based on daily mean near-surface air temperature data.

Runoff
Runoff is the amount of water discharged through surface and subsurface streams, including all precipitation, snow melt and irrigation water that is neither absorbed by the soil nor evaporated.

Very hot days
Very hot days refer to days with a maximum near-surface air temperature above 35 °C.

Heat-related mortality
Excess mortality attributable to heat is projected using the corresponding TRMM which keeps population data from 2005 as a constant.

Soil moisture
Soil moisture projections are based on root-zone soil moisture estimates (the portion of soil moisture that is found within the rooting depth of plants).

Precipitation
Precipitation change projections are based on daily precipitation sums from the GCMs.

Crop yield
Crop yield projections are based on the GGCMs and 2005 level land use patterns and agricultural management (irrigation, fertiliser use, growing seasons).

Sea level rise
National sea level rise projections were obtained from total sea level rise data averaged along the coastline of a country.

Heavy precipitation events
A heavy precipitation event is defined as a day on which the precipitation sum exceeds the 98th percentile of the daily precipitation sums of all wet days from 1861 to 1983, where a wet day is a day with a precipitation sum of at least 0.1 mm.

Species richness
Projections of species richness are based on probabilities of occurrence of amphibian, bird and mammal species.

[11] GEPIC, LPJmL, PEPIC
[12] LPJ-GUESS, LPJmL, ORCHIDEE
[13] BioScen1.5-SDM-GAM, BioScen1.5-SDM-GBM
[14] TRM-Tsukuba

Potential evapotranspiration
Evapotranspiration is the combined evaporation and plant transpiration from the Earth's land and ocean surface to the atmosphere. Potential evapotranspiration is the amount of evapotranspiration that would occur if sufficient water was available.

Tree cover
Projections are based on the GVMs considering the effects of CO2 fertilisation and using constant year 2005 level land use patterns. Assessments use 2020 as the reference year for tree cover projections to ensure that the depicted changes reflect the pure effect of future climate change.

Exposure to river floods
A grid cell is considered to be exposed to river flooding at least once a year if the maximum annual discharge exceeds the 100-year return level under pre-industrial conditions.

Exposure to heatwaves
Projections of population exposure to heatwaves are based on daily mean near-surface relative humidity and daily mean and maximum near-surface air temperature data

Water availability
A country is said to be under water stress (face water scarcity) when water supplies drop below 1700 (1000) cubic metres per person per year.

Exposure to droughts
For projections of the crop land area exposed to drought at least once a year, a drought index based on soil moisture projections from the GHMs is used (Lange et al., 2020b).

The Country Risk Profiles are intended to offer an up-to-date, down-scaled and accessible climate risk analysis of current and projected climate and weather-related risks, which will be used to inform the climate-security risk analysis.

ii. Contextual analysis of climate-related security risks

The contextual analysis will be predominantly qualitative, applying the climate impact data from the Climate Risk Profiles to a social and political economy analysis of the context using a framework based on the state-of-the-art of conflict analysis and resilience and vulnerability assessments. The analytical framework (see figure above) builds upon experiences and lessons learned in similar assessments and projects such as:

- Shoring up Stability;
- UNEP's Climate Change and Security project;
- UN Climate Security Mechanism's toolbox;
- Chatham House's climate change risk assessment.

Importantly, the approach seeks to identify not only peace and security risks but also dimensions of resilience across different groups and communities. We will include standardised sets of questions for each element of the analytical framework to be used to guide literature reviews, qualitative field research, and interviews (see Annex). Visual approaches to map interactions between different drivers of instability and conflict are also part of the qualitative analysis. These visual approaches will help to link back and feed into the quantitative modelling.

The field research, expert interviews and stakeholder dialogues will be supplemented by desk research to establish a comprehensive understanding of dimensions of risk and resilience across a range of societal actors at different scales. Research will be locally

led wherever possible, supported by relevant regional partners, including those named in section *5.* A set of guidelines will be created for partner organisations carrying out the research, indicating different possible variants of the qualitative research components and their minimum scope.

All field research will be conducted using conflict sensitive research methods. The general approach preferred is one of storytelling, allowing respondents to share their truths and experiences without limitations. A gender-sensitive and intersectional research approach will ensure findings are disaggregated by gender, age and identify groups to better understand the heterogeneity of risks and dimensions of resilience across contexts and actor groups.

iii. Foresight and scenario planning: consultations and expert judgement elicitation

A central element of this assessment methodology is its forward-looking element. We use elements of foresight to develop and present a range of plausible futures that can be used to better prepare for future risks and identify appropriate preventative actions. This will be done through structured scenario planning activities using the results of quantitative and qualitative analyses, while feeding back into these approaches to improve them further.

Our quantitative and qualitative research will inform experts about i) important climatic variables and contextual factors of conflict emergence, and ii) present them with possible security futures in a changing climate. Experts and stakeholders will be asked about the plausibility of these outcomes, elaborate on further possible developments and what can be done to prevent or reduce adverse security consequences.

Scenarios will use a time horizon of one to four years. These shorter-term horizons are those most relevant to policy makers and operational planners. To ensure the long-view is not lost, these shorter-term scenarios will be supplemented by longer-term (10-30 year) trajectories offered by the machine learning and regression-based modelling components (see step iv below). In developing these long-term scenarios, we will be mindful of the strengths and weaknesses of climate models when considering 10-30 year timescales.

Scenario planning will follow a basic two-by-two matrix approach in which analysts will identify two critical uncertainties – based on the quantitative and qualitative analysis - and construct four possible future trajectories. Where possible, through expert consultations, up to four scenarios will be further developed through rigorous scenario-planning exercises, which involve multiple uncertainties and imagining how different combinations could yield situations that are different from what an extrapolation of the present would present. Key questions for the scenario development exercise include assessing the key socio-political, technological, demographic, diplomatic, military and economic drivers that will shape the climate security risk landscape in a given country/region, based on the expected physical climate change effects over the next four years. Specifically, the scenarios will aim to elicit the most important and most uncertain drivers of risk. A subsequent stage of expert elicitation and analysis will then develop up to four scenarios for each context, identifying:

- What the scenario means for key actors (e.g. society, state, non-profit, private sector, international)?
- Which types of actors have power in the scenario and why?
- Which critical geographies most affected by climate-related security risks?
- Key indicators and warnings to watch for that would suggest the scenario is likely.
- Key decision points for policymakers that would lead toward one scenario or another.

By subsequently back-casting, the scenario planners could identify what conditions would lead to such a future. An important aspect of the scenario planning process is to document both plausible narratives of how a future might happen *and* the internal logic that describes how it was derived. The scenarios are not intended to be predictive. They provide a policy making support tool, identifying specific questions and enabling thinking and planning in more concrete terms about possible repercussions for conflict risk.

Adding a quantitative element and an empirical evaluation of scenarios to our methodology, we will draw on structure expert judgement / "Wisdom of the Crowds". The value of this step is to test for any subjective bias within the qualitative analysis and scenario building process. This approach also helps circumvent the problem of the 'black box' – that is the lack of transparency and replicability often associated with scenario work. We will provide a select group of 15-30 heterogeneous experts across different discipline with the scenarios developed in previous steps of the methodology and will ask them to assess their probability. In transmitting scenarios to experts, we will be careful to set them out into clear and precise questions to improve the quality of probability assessments. Experts' judgement will be compiled according to the 'Wisdom of the Crowds' method to arrive at a qualified judgement and assess, which scenarios are more likely to emerge. Where possible, we will repeat this process in multiple rounds. By building on the qualified and compiled insights of multiple experts, this approach will strengthen our foresight and scenario work.

iv. Machine Learning based assumption testing and validation process

An additional level of quantitative analysis, namely using machine learning and regression analysis, will be used to help us test and validate our qualitative analyses, identify any trends across certain contexts, outliers or additional indicators not captured through the qualitative analysis in order to refine the analytical approach. This step is intended to help verify our understanding of *when* and *how* climate-related security risks emerge in certain contexts. The central research question guiding this step is which types of direct and indirect climate-related impacts contribute to which types conflicts and insecurity (at different scales), and under which circumstances?

The focus will be on identifying i) the most influential socio-economic and political drivers of insecurity that are impacted by climate change in various typologies of context (e.g. by governance context, predominant economic sectors, biophysical and geographic context), and ii) climate impacts, which have the most adverse effects on specific types of insecurity (ranging from crime and political instability to violent conflict) in particular

geographic, socio-economic and political contexts.[15] This analysis will entail approaches such as regression analysis and tree-based methods, in particular the random forest method.[16] Machine learning will be applied to understand which of the available quantitative variables help us to *identify* conflict. Regression analysis and machine learning will help to characterise the *pathways* through and *contexts* in which climate change exacerbates risks of conflict. To do this, we will build and test a large data set of climatic, socio-economic, political and conflict variables at the sub-national level. The analyses will be conducted at the sub-national level to ensure sufficient level of detail necessary for understanding specific contexts.

Being cognisant of the limitations in terms of quantifying systemic risks, this quantitative analysis is not meant to produce hotspot maps, detect geographical areas that are more at risk than others, or predict likelihoods of systemic risk outcomes.[17]

v. Identification of responses

A final important aspect of the methodology focuses on identifying context-specific response measures to address climate-related security risks. The focus will be on inclusive and integrated responses that build resilience against both climate and conflict risks and include a special focus on 'no regret options' in the face of uncertainty and shifting probabilities of climate-related hazards and future socio-political developments. This aspect will be based on the emerging lessons learned from locally-informed field research and consultations, nature-based solutions, sector-neutral or integrated programming.

Expert judgement will be elicited and incorporated in the process of identification of trends for policy makers to be aware of, and prioritisation of 'no regrets' response options. Whilst our methodology does not seek to make predictions, we draw on state-of-the-art forecasting expertise to help identify the most likely futures to inform the selection of 'no regrets' approaches. Through professional crowd-sourced insights and quantified, well-calibrated forecasts, we will horizon scan for black or grey swan events where climate risks can come together with potential changes to the social, political and economic landscape of a given context. Through this process, we will seek to convert strategic uncertainty into manageable risk to help inform no regrets approaches and to minimise potential unintended negative consequences, or backdrafts, from maladaptive strategies.

We will also include an assessment of existing and necessary resources and capacities for response options to be adopted, including urgent gaps in capacities.

[15] To assess and classify *conflict* types, we will use datasets by the Armed Conflict Location & Event Data Project (ACLED) and the six event types and 25 sub-event types it defines.

[16] Random Forest is a machine learning algorithm that is commonly used for the classification and regression of data. Random forests build on the results of a variety of different decision trees to make the best possible decisions or predictions.

[17] The limitations include, for example, the general lack of available downscaled governance data and the high complexity of socio-political systems with many intervening variables. For a more detailed discussion see Detges (2017).

Replicability

The broad assessment approach will be openly accessible, free to use and replicable. Some aspects of the approach however are not intended to be and thus will not be replicable by actors without experience in quantitative analysis and access to data and modelling resources. In order to ensure that key parts of the methodology are usable by relevant stakeholders, the methodology will be translated into guiding documents and tools for these stakeholders and as much of the impact data will be made available in a user-friendly format. This includes:

- **Easy-to-access climate change impact data**;
- **A set of indicators** at different scales and complexities **that can be used to identify risks, trends and moderating factors as well as factors contributing to resilience**, in order to track progress in resilience building (on different geographic levels). This will take into account and build upon the SDG indicators where possible;
- **Climate Risk Profiles** (for select countries/regions);
- **An overview of the most important socio-economic, political and climatic drivers of insecurity and conflicts**, based on the results of the quantitative assessment (for select countries/regions);
- **Guiding questions** for the qualitative research;
- **Graphic tool for participatory assessments based on pathways**.

5. Partners

The process of developing the methodology and implementing the *Weathering Risk* assessments will involve a broad range of stakeholders and partners. This will ensure that the methodology is fit-for-purpose, improve the take up of the assessment approach, and allow for mutual learning.

The following group of partners will be closely involved and implement and test parts of the methodology:

- Chatham House
- CGIAR
- The Economist Intelligence Unit (EIU)
- Institute for Security Studies (ISS Africa)
- Igarapé Institute
- UNDP
- UNEP
- United Nations University
- The World Bank

In addition, broad stakeholder consultations will form a central part of testing the methodology.

Annex

Analytical framework: Guiding questions for field research

The following guiding questions are based on and informed by the Shoring up Stability methodology, UN Climate Security Mechanism's Toolbox, the assessments carried out by the Climate Security Expert Network, UNEP's climate and security project and their Joint Program on Women, Natural Resources and Peace.

Please note that the guiding questions overlap and not all questions are relevant for every context. The overlaps indicate links and interactions between the different parts of the framework and are not meant to duplicate certain parts of the analysis, but are parts of the analysis that are particularly important. The order of the questions does not imply an order for the analysis. This is particularly the case for the cross-cutting questions that play a role across all elements.

The general approach preferred is one of storytelling, allowing respondents to share their truths and experiences without limitations. The following questions are meant as repository to guide conversations and shape coding and analysis.

Climate Pressures: What are the most important climate change impacts (on human security)?

- What sudden-onset changes such as, storms and floods, are affecting the population/region?
- What are the slower, longer-term effects of climate change in the region (e.g. slow onset changes such as temperature increase, ocean acidification, land degradation, glacial retreat or sea-level rise)?
- What are predicted future climate change impacts?
- Are there specific regions, groups, communities, economic or cultural assets that are particularly exposed to climatic pressures and shocks? For example:
  - Highlands vs. plains/coastal areas
  - Rural communities vs. urban areas
  - Areas/installations with large numbers of employment opportunities (including agriculture)
  - Indigenous peoples and local communities reliant on biodiversity and ecosystem services
  - Different genders or groups
  - Energy plants, highways, other infrastructure
  - Cultural heritage or religious sites

Peace and Security Context: What are the most important security risks?

- What are the main drivers of instability and insecurity?
- What are the root causes of instability and insecurity?
- What are current and past dynamics of insecurity including crime, violence against women, violent conflict and political instability?
- Who are the main actors of instability and conflict?
- How are different groups (including gender, age, ethnicity, and religion) affected by insecurity and conflict?

Climate-related security risks/pathways: How do climate stressors and security risks interact to undermine human security?

Increasing natural resource competition/conflict

- What is the availability and access to natural resources (incl. land, water and forests) and how does this vary between different societal groups?
- What kinds of environmental change affect natural resource availability and access, and who is driving these changes?
- How do different societal groups (including gender, age, ethnicity, and religion) use resources and for what purpose?
- How are natural resources managed or controlled? Who, if anyone, is excluded from management processes?
- How does climate change affect access to, availability, and quality of resources in general, and for different groups?
- How do conflict and insecurity affect access to, availability, quality and management of natural resources in general, and for different groups?
- Have disputes over natural resource access, use, or control contributed to triggering or perpetuating conflict and violence? If so, how?
- When disputes arise, who is responsible for resolving them? Is someone excluded from conflict resolution?

Livelihood insecurity

- What kind of livelihoods are different groups (women, men, young, old, ethnic identity, etc.) relying on?
- How do climate change and environmental degradation affect the livelihoods of different groups?
- How does climate change impact key economic sectors?
- How does conflict affect the livelihoods of different groups?
- What role does livelihood insecurity play in the existing conflict dynamics?
- How are different livelihood practices contributing to environmental degradation and/or conflict (for example mining or woodcutting)?
- Which role is livelihood insecurity playing in undermining and challenging the government and its legitimacy?
- Which role is livelihood insecurity playing in recruitment into non-state armed and organized crime groups?

Human mobility

- How are the impacts of climate change affecting the movement of people? Including
  - Displacement
  - Seasonal migration and transhumance
  - Long-term migration
- How are migrants impacting livelihood security and access to public services in destination areas and at the origin?
- How are migrants impacted by insecurity and climate change (in destination area)?
- What is the situation of migrants in destination areas (especially regarding livelihood security and public service access)?

Food price spikes and food insecurity

- How does climate change impact regional and domestic food production and prices?
- How is conflict and insecurity impacting food production and prices?
- How dependent is a country on food imports?
- Is the government subsidizing certain food items, for example bread?
- What are the economic, social and political consequences of sudden food price spikes or food shortages?
- Are there certain staples of food supply that are particularly vulnerable to climate impacts and/or price shocks?

Extreme weather events challenge governments

- How are different economic sectors affected by extreme weather events?
- How is (critical) infrastructure impacted by extreme weather events?
- How are different societal groups (including gender, age, ethnicity, religion) affected by extreme weather events?
- How effective is the government in responding to extreme weather events?
- Do certain population groups or regions feel excluded from disaster response or preparation?
- How are extreme weather events affecting government budgets and priorities?

Unintended, negative impacts of climate and security policies

- How will the combined impact of climate change and mitigation/adaptation policies affect the political economy in the area/region? For example:
  - Are there any national economies particularly impacted by global policy changes for example the switch from fossil fuels to renewable energies?
  - How is economic growth and political stability impacted by deep and comprehensive transition policies?
  - Are adaptation or mitigation measures having transboundary impacts (for example the construction of dams or irrigation infrastructure or weather manipulation?
- How are military and security actions and strategies impacting livelihoods and the resilience of different population groups?
- Do climate change mitigation/adaptation/livelihood projects take dynamics of insecurity and conflict into account? Are they implemented in a conflict-sensitive way and do they take human rights risks into account? Do they have environmental and social safeguards?
- Do stabilisation and peacebuilding projects and strategies take climate risks into account? How are they impacting livelihood security?

International tensions

- How will climate change impact the political economy in the region? For example
  - How are migratory patterns of fish stock affected and what impacts does this have for livelihoods and national economies?
  - How does migration impact human capital and productivity?
  - Do climate change impacts affect trade routes and access to before inaccessible resources (for example through the melting of sea ice)?

- Does climate change threaten changing natural features that also serve as borders between countries, for example rivers changing course or sea levels rising?
- Are there transboundary water bodies such as rivers, lakes, and aquifers that different countries rely on for economic activities such as hydropower production or irrigation agriculture? How are they affected by climate change?
- Are there any large-scale infrastructure projects that might impact natural resource access or availability of another country?
- Is there (the potential for) large-scale cross-border movements of people driven by climate change and/or insecurity?

Context factors shaping vulnerability and resilience: What are other important factors and trends that are affecting vulnerability and resilience to climate and security risks?

- Which groups are marginalised and excluded (economically, socially and political) and why?
- How are different genders affected by conflict and climate change and why?
- How are differently abled people affected by conflict and climate change and why?
- How are people of different ages affected by conflict and climate change and why?
- What access do different genders/groups have to
  - productive assets (financial, technological, etc.)?
  - education?
  - health services?
  - political processes/decision making?
  - justice and the legal system?
- What is the state of relationships between different groups, communities and actors?
- What is the state of social capital and cohesion?
- What attempts, if any, have been made to prevent or resolve conflicts? What mechanisms have been used and who has been involved? Who has been excluded?
- Which role do different actors and genders play in conflict prevention, peacebuilding and climate change adaptation?
- What are points of cooperation between different conflicting actors?
- How is the government able to fulfill its main functions:
  - providing public safety and security?
  - providing basic services?
  - taking legitimate political decisions?
- How is the legitimacy of the government perceived by different actors and groups? What is the state of trust in the government?
- How is the government responding to challenges and crisis? What is the impact of their response?
- Is there sufficient capacity at the local, national or regional levels to cope with the impacts of climate change and insecurity? For example:
  - Do local or national governments possess the capacity and legitimacy to act decisively?
  - Do national climate change adaptation policies and plans include climate-related security risks?
  - Are decision-making mechanisms inclusive and how strong is civil society?

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Imprint

Published by

adelphi research gemeinnützige GmbH
Alt-Moabit 91, 10559 Berlin
+49 (030) 8900068-0
office@adelphi.de
https://www.adelphi.de/en

Potsdam Institute for Climate Impact Research (PIK) e.V.
Telegraphenberg A 31, 14473 Potsdam
http://www.pik-potsdam.de

Header Image

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Authors

Lukas Rüttinger, Janani Vivekananda, Christian König, Barbora Sedova

Contact

Janani Vivekananda
vivekananda@adelphi.de
Barbora Sedova
sedova@pik-potsdam.de

Acknowledgements

The authors would like to thank Adrien Detges, Hannah Elisabeth Kurnoth and Benjamin Pohl from adelphi and Lisa Binder, Sidney Michelini and Jacob Schewe from PIK, as well as Christoph Gornot, Stefan Lange and the whole PIK AGRICA project team for their invaluable contributions.

We are grateful to Oli Brown, Chatham House, Tarek Ghani, the International Crisis Group, Adam Day, the United Nations University, and Corey Pattinson, the World Bank, for their helpful inputs in the development of this paper.

Date

May 2021

Led by:

adelphi

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Supported by:

Federal Foreign Office

Norwegian Ministry of Foreign Affairs

UK Government

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Irish Aid
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