RESILIENCE AND SUSTAINABLE PEACE

MANAGING CLIMATE RELATED SECURITY & DEVELOPMENT RISKS IN THE ANTHROPOCENE

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This background paper is a joint contribution by the **Guidance for Resilience in the Anthropocene: Investments for Development" (GRAID)** and the **Global Resilience Partnership (GRP)**

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Social-ecological resilience

Resilience thinking offers theory, practices and evidence to better navigate through the dynamics of climate change related risks[1,2]. In essence, resilience can be described as the capacity of a system, be it a community, nation or region, to deal with change and continue to develop. Resilience thinking challenges status quo thinking in development and risk management in three ways:

1) *Beyond locally:* In the context of climate change at a global scale, vulnerable contexts are no longer only shaped by local processes[3]. Global changes and transboundary processes influence local dynamics, and local events have global consequences, as local industries and processes can contribute disproportionately to climate change, biodiversity loss and migration. Many extreme weather events witnessed in recent years for example have taken place in some of the world's most critical food producing locations, which has directly led to prolonged crop failures causing global food prices to spike[4]. Where there is low resilience and a tense context, such events can contribute to triggering violent conflict. Indeed, this core aspect of resilience lies in understanding contexts of vulnerability as strongly and simultaneously influenced by historical processes, upcoming needs, changes in distant areas and immediate situations. For this reason, building resilience locally implies not only local adaption or responses to global pressures, but also changing and removing global and distal processes that influence local sustainability.

2) Beyond sustainability: Peace, poverty alleviation, and global environmental sustainability – people and the planet – are deeply linked[5]. Geopolitics are fundamentally rooted in biophysical processes[4], however, deeper biophysical systemic drivers are often overlooked as contributors to socio-political instability. A holistic, systemic framework is necessary to understand that different crises can be interdependent. To effectively build resilience in vulnerable and fragile contexts, efforts must be integrated with environmental

conservation, building sustainable food and energy production systems, designing green economies and supporting climate resilient societies[6]. Without oceans and forests, air and ice, waterways and rich biodiversity, humanity will not survive, let alone thrive. To sustain peace, development must focus on the Earth system – humanity's life support system – and help a growing population to weather future storms.

3) Beyond persisting: Improving human wellbeing for all will require radical and transformative change. While human-driven changes are pushing the Earth system beyond known conditions, peacebuilding and development initiatives also aims to bring societies to levels of wellbeing that have never been experienced by all of humanity - eliminating poverty, hunger and conflict for example. Hence, from a resilience perspective, peacebuilding and development actions should support people to thrive within changing circumstances, learning to navigate uncertainty, continuously re-assessing needs, impacts, behaviours and aspirations of people in different contexts[7]. Here, basic principles include taking adaptive management approaches and using the precautionary principle to avoid unwanted consequences of development actions. Tools for transformations towards sustainability exist, such as the Wayfinder tool[8]. First and foremost, peacebuilding and development actions should be co-produced with the right people - stakeholders involved in the larger system of change – to create a 'coalition for change'. It is such coalitions that have the power to identify, map and discuss the trade-offs and synergies of differentiated needs and impacts, and thus develop pathways of transformation that will allow for people to go beyond persisting and to thrive.

Peace and resilience

By casting a systemic lens on vulnerable and fragile contexts, resilience approaches can form an intrinsic part of peacebuilding[9]. Conflicts are increasingly understood as being about the distribution of power rooted within changing social-ecological systems. Using resilience approaches to highlight not only immediate vulnerabilities, but also the wider systems of distributions – i.e. the root causes of change – allows one to take concrete steps towards sustaining peace. Such steps include creating platforms for dialogue among different stakeholders, tracking the businesses and corporations that have stakes across production value-chains[10], identifying the financial system leverage points that support unsustainable investments[11,12] and more.

Climate-related conflicts are not something of a distant future. Climate change is set to create more than 140 million new migrants in Sub-Saharan Africa, South Asia and Latin America by 2050 according to the World Bank. In the context of peace and security, resilience thinking can help us reflect on how humans and nature can bounce back from shocks and disturbances like climate change and forced displacement – and offer insights on how peace can be sustained to prevent a system from collapsing into violent conflict[13].

A system in conflict can also be resistant to peacebuilding efforts, locked into dynamics that reinforce and reproduce causes of tensions. Resilience thinking and the science on transformations can help identify leverage points for change and inform on how to use

shocks and disturbances to spur renewal and innovative thinking. For instance, in Aceh, Indonesia, the effects of the 2004 tsunami has overshadowed the conflict and helped the people to find a new pathway to peace[14,15]. In this way, building resilience for peace and stability takes place away from conflict, both pre-emptively – as not all situations of peace are resilient, and in post-conflict peacebuilding contexts, and breaking resilience takes place to transform undesirable, conflict situations.

To prevent climate-related conflicts from arising, it is important that resilience thinking is applied *proactively.* Indeed, navigating away rather than de-escalating conflict or instability is important to avoid deterioration of human prosperity, safety and security[16]. By offering a systemic lens, resilience thinking helps practitioners to anticipate unpredictable changes in system dynamics and allow for proactive management of sudden changes cropping up within the social or biophysical system. In doing so, social-ecological resilience can help decrease vulnerability and conflict risk.

Concretely, resilience thinking offers practitioners anticipatory conflict management tools to mitigate conflict, such as social capital building through a network of strategic alliances at multiple levels; embedding learning-based management as a guiding principle; or enabling a set of diverse stakeholders to equitably manage resources[17]. Social capital in particular is valuable as it can strengthen networks of trust and cooperation between fragmented communities and thus help mitigate risk and preempt conflict. Organizations such as UNEP are already implementing a range of anticipatory management tools such as the building of social capital to strengthen resilience in local systems vulnerable to different climate and security risks. Nonetheless, there is no blueprint of which anticipatory approaches to build resilience will ultimately have the desired effects, and continuous learning of what works in a given context is important[18].

Complex adaptive systems – perspectives for building resilience in the Anthropocene

Acknowledging that system-wide risks can be investigated and understood through a resilience thinking lens calls for a deeper understanding of the complexity that is inherent to interconnected and ever changing social-ecological systems. Complexity emerges as a systemic property which comes about due to the relations and feedbacks that characterise such systems[19]. These relations, processes and causal synergies can be observed and analysed to understand the behaviour of complex interconnected systems that adapt over time, have creative capacities to self-organise and re-organise themselves in relation to contextual changes[20]. Any change in the context will have an impact on the function and behaviour of the system and any change in the system will have a recursive response to the context. Following this logic, the resilience of such systems will depend on 1) their capacity to reconfigure or stabilise relations and the organisational processes that support and legitimise these relations and the institutional structures they create, and 2) the ability of people and institutions to create opportunity contexts that allow the new relations to grow and develop new forms of agency and legitimacy[21,22].

Conventional theories of change assume that change comes about through the effects of a linear causal chain of events that can be traced back to a specific origin. A complexity approach assumes that change comes about as a result of simultaneous multiple causes that produce non-linear feedback effects in the system. These changes bring about a shift in the characteristics, patterns or relationships that differ qualitatively from previous conditions[21]. Any change on one level of interaction affects multiple feedback loops across different scales to produce both intended and unintended consequences. Due to interacting feedback mechanisms it is possible for small changes to have large effects in relation to the dynamics of the system as a whole (or, in other cases, for large changes to have little effect on the overall dynamics of the system). This understanding of how systemic changes in complex adaptive systems happen, has direct implications for how we engage with and intervene in social-ecological systems to effect change and how we respond to addressing the nature and effects of systemic risks.

From a practical perspective a complexity-based, relational theory of change suggests the following important principles: i) contexts matter, ii) relations matter, and iii) system-wide, recursive loops of relations shape and change the context they come from. Complexity-based approaches to building resilience are therefore based on repeated monitoring, learning and experimentation. Such approaches are designed to track and understand how effects of peace-building interventions, for instance, cascade through a system to reshape the original context for which the interventions were designed.

From such complexity perspectives, contexts are more than the '*here and now*' of potential conflict situations. Contexts include temporal baggage such as local histories, traditions or injustices. Contexts also include distal processes - hydrological manipulations on another part of the globe, political statements from leaders of powerful foreign economies, or up and downturns in value chains that influence local climate, trade security, production costs and more. It is from an understanding of these broader contexts that resilience building and sustainability transformations can take place.

The Anthropocene: connected contexts, connected risks

Humanity is the dominant driving force of Earth system change and increasing scientific evidence indicates that Earth has entered a new geological epoch, the Anthropocene[23]. In the twentieth century, many global socio-economic trends (e.g. population growth, real GDP growth, foreign direct investments, energy uses, fertilizer consumption) and earth system trends (e.g. atmospheric carbon dioxide emissions, ocean acidification, marine fish capture) reached take-off points and are on an accelerating pathway (Figure 1).

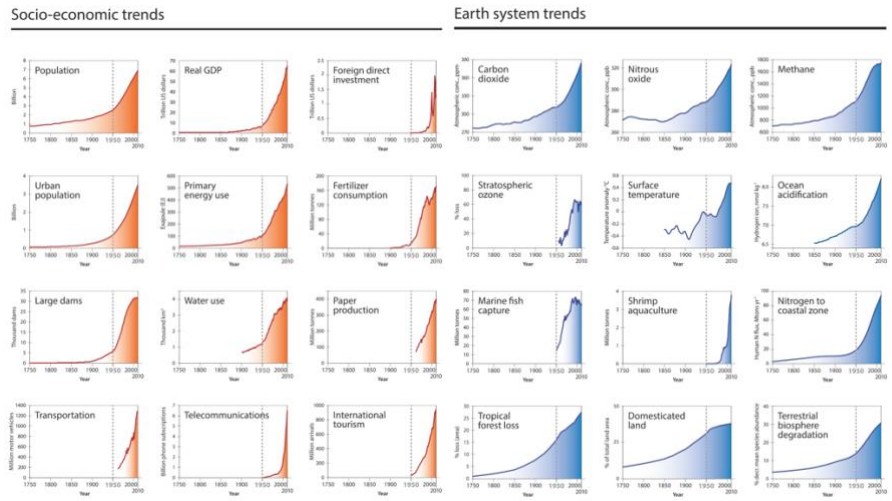

Figure 1: The Great Acceleration - from the International Geosphere-Biosphere Program (IGBP) http://www.igbp.net/.

The Great Acceleration has generated phenomenal social, economic and technological development resulting in significant improvements in human wellbeing for many. However, poverty and increasing inequality continue to be major challenges, and there have been collateral costs to oceans, biodiversity, water quality, and the functioning of the biosphere as a whole. For example, human activity has altered more than 75% of the world's terrestrial habitats, with almost 40% of all productive land having been converted into agricultural areas[24] and 60% of all boreal forests being under some form of management, mainly for wood production[25]. In the seas, around 90% of large industrial fisheries are either overexploited or fully exploited[26], and a rapidly expanding aquaculture sector is occupying increasing areas of coastal and offshore space[27].

Humanity has – through these massive changes to the biosphere and the inertia of socio-political systems – already committed the climate system to a state unseen in the past 1,2 million years. This means that changes Humanity has made to the Earth system - including unprecedented greenhouse gas emissions - are pushing Earth System dynamics into conditions that have never been experienced by Humanity. Indeed, the Anthropocene has been conceptualized as a trajectory of Earth System dynamics which deviates substantially from the relatively stable Holocene conditions of the past 10,000 years. It is in the Holocene that agriculture, sedentary communities, and eventually, socially and technologically complex human societies developed and thrived[28]. This is why current deep and rapid changes to the functioning of the Earth System are understood to pose increasing risks and threaten our ability to secure well-being for all, now and in the future.

At the same time, while Anthropocene changes are global in scale, distributions of impacts, vulnerabilities and of opportunities to overcome the challenges are unequally distributed and gaps between nations are widening. The global North, with relatively high-income levels and more developed economies, is less vulnerable and exposed to impacts of climate change (such as floods, storms, soil erosion or droughts) and better placed to

cope with its effects than the global South. At the same time, industrialized nations are largely responsible for high carbon emissions, and thus have contributed most to the issue of climate change in the first place. Moreover, the capacity of developing states in the South to adapt to impacts of climate change is much lower due to interacting and immediate challenges including poverty, hunger, social inequities and weaker institutions.

Challenges of the Anthropocene are therefore multiple: we need to transform current social, technological and economic systems that create and reinforce environmental destruction and social injustices, while reducing inequalities and protecting the vulnerable from increasingly frequent and extreme climate events.

Systemic risks in the Anthropocene

The hyper-connected nature of the world we live in – where global stressors have a disproportionate effect in vulnerable and fragile contexts – increases chances that small, local failures in a system (e.g. a disease outbreak) escalate into global systemic risks. For instance when a disease outbreak becomes – through air travel – a global epidemic with impacts on global health and with widespread consequences on businesses and economies worldwide[29–31]. Systemic risks describe situations where a crisis or shock in one domain such as ecosystem health can increase risk in an unbounded number of interdependent domains such as our global climate, food and water supplies, energy and financial systems[29,31]. They stem from interactions at the interface of multiple systems (for example, climatic, ecological, political, financial and technological), making it hard to identify causes and to foresee outcomes.

Climate change is often seen as a risk multiplier, that exacerbates other pre-existing conditions, such as conflict, poverty, or hunger[32–34]. Changing climate can increase the potential for violent conflict when it compounds existing vulnerabilities, for instance migration as a coping-mechanisms in response to droughts, floods and other weather effects, coupled with pre-existing inter-communal tensions, can result in heightened tensions and even violent conflict. Such climate linked conflicts have served as one "*explanatory factor for asylum seeking in the period 2011–2015*"[35,36]. Climate change has also been linked to heightened interstate conflict potential over fishery resources due to altered distributions of transboundary species[37]. Conflicts in turn present risks to a host of connected domains such as food security[36,38], geopolitical relations[39] even business profitability[40].

An illustrative example of a systemic Anthropocene risk is how the more efficient use of water in one area of the world can have massive consequences on rainfall in another region. This is for instance the case of hydrological teleconnections that link evaporation rates in one part of the world to the precipitations in other, where for example agricultural expansion in India influences rainfed agriculture in East Africa. The situation presents a delicate dilemma: if communities in India improve sustainable agriculture practices (reduced irrigation and groundwater depletion), it could reduce the supply of water that evaporates and lead to a significant depletion in East African rainfall, with corresponding

consequences for productivity of local ecosystem services, such as water for animals, agriculture, trees, and more. Such an interruption in rainfall could also have regional impacts: it might trigger migration and lead to conflict over the distribution of resources[41].

The global food system is also part of emerging systemic Anthropocene risks[42]. In tandem with the massive growth of international trade there has been an increase in connections between different food production sectors. For example, the aquaculture sector, which has traditionally relied heavily on wild caught fish as the main source for feed, is shifting towards crop-based feed (for example, soy, rapeseed and maize) in response to declining fish catches[43]. This increased dependence of aquaculture on crops make seafood production vulnerable to droughts or crop pest outbreaks on land. Moreover, food production systems around the world are increasingly exposed to the price fluctuations of inputs (for example, fossil fuels, fertilizers and technology); shifts in global consumer preferences (for example, diets); changes in policies (for example, regulations on energy and exports) and financial speculation on food commodities[42]. Recent food price spikes in 2008 and 2010 provide an illustration of how energy prices, connected food production systems, and financial markets triggered shocks to societies and places around the globe, with vast multisystem impacts on individuals, communities and political systems (including food riots and violence in dozens of countries such as Bangladesh, Burkina Faso, Cameroon, Egypt, Indonesia, and Yemen)[44].

Informing effective policymaking and development practice in the Anthropocene requires understanding these cross-scale dynamics that emerge from connections between local and global-scale processes. This might require looking at changes that happen over years, decades, centuries, or even millennia, and identifying global and distant processes that shape local dynamics, as well as the role of local processes in global dynamics. Once the system starts to be characterised, policymakers and development practitioners can build capacity in the system to monitor and respond to changes. To use the hydrological telecoupling example, this could mean improving communication among agricultural extension offices, meteorological monitoring systems, and perhaps even early warning systems connected to groundwater monitors in India, in order to contribute to drought prevention in East Africa[45].

Managing risks has traditionally focused on local systems and their capacity to deal with a narrow range of relatively well-understood shocks, such as drought, fire, pest outbreaks and, increasingly, climate change. As the Anthropocene unfolds, completely new approaches are necessary to manage unpredictable, cross-scale, cascading risks (also known as nested and teleconnected vulnerabilities[46], hyper-risks[29], global systemic risks[47] and Anthropocene risk[41]. Anthropocene challenges are best tackled with resilience thinking approaches that cast systemic lenses on dynamics, that anticipate unpredictable changes and that allow to navigate sudden changes, through adaptations or transformations. Furthermore, understanding resilience allows to better anticipate where vulnerabilities might be most felt.

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