



**Integrating sustainable development and security:
An analytical approach with examples from the Middle
East and North Africa, the Arctic and Central Asia**

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ABSTRACT

Ecological, financial and political systems are under increasing pressure from human activities, facing growing uncertainties that challenge widely held views on sustainable development. At the same time, experts in conventional (hard) security are confronting a new set of threats that go beyond traditional interstate armed conflict, related to natural resources constraints, climate change and environmental degradation. It is important to understand how these trends affect security, and how they may interact with one another. A common analytical approach in both the sustainable development and security research communities is to use scenarios to explore possible futures and identify options. However, while the sustainable development community tends to look at relatively long time horizons and presume fairly stable geopolitical conditions, the security research community typically uses shorter time horizons and views political-economic factors as dynamic. This paper presents an integrated analytical approach for improving development outcomes through an inclusive strategic scenario-driven approach. This seems particularly relevant in regions where development and/or security challenges are mounting, in post-conflict regions, and in any other region where conditions warrant a more innovative approach for exploring robust and sustainable futures. The approach includes three steps: understanding the broader socio-economic and environmental context; developing scenarios through a participatory process; and appraising options for robust governance and development investments. Such an approach can help foster a more dynamic and broader view of sustainable development, informed by insights from the security realm.

CONTENTS

1 Introduction	5
2 Integrating sustainable development and security	6
2.1 Unpacking sustainable development	6
2.2 Alternative framings of security	7
2.3 Common characteristics	8
3 Case examples	9
3.1 The wider security-sustainability in the Nile and the Euphrates and Tigris regions	9
3.2 Different views on security in the Arctic	11
3.3 Development in the Post-Soviet Space – the Central Asia case.....	14
4 Introducing a scenario-based analytical approach	16
4.1 Scenarios as a shared tool in sustainable development and security studies.....	16
4.1.1 <i>Exploratory scenarios in sustainable development studies</i>	16
4.1.2 <i>Explorative scenario in security studies</i>	17
4.2 A scenario-based analytical approach for comprehensive analyses	17
4.2.1 <i>Context analysis</i>	18
4.2.2 <i>Participatory scenario building</i>	19
4.2.3 <i>Options appraisal</i>	20
5 Applying the integrated framework	21
5.1 Understanding the wider political, economic and environmental context	21
5.2 The use of scenarios	22
5.3 Moving towards tangible options.....	23
6 Conclusion	23
References	25

“Climate change can indirectly increase risks of violent conflicts in the form of civil war and inter-group violence by amplifying well-documented drivers of these conflicts such as poverty and economic shocks (*medium confidence*). Multiple lines of evidence relate climate variability to these forms of conflict.”

– Intergovernmental Panel on Climate Change, *Fifth Assessment Report* (2014, p.74).

“Climate change poses another significant challenge for the United States and the world at large...The pressures caused by climate change will influence resource competition while placing additional burdens on economies, societies, and governance institutions around the world. These effects are threat multipliers that will aggravate stressors abroad such as poverty, environmental degradation, political instability, and social tensions – conditions that can enable terrorist activity and other forms of violence.”

– U.S. Department of Defense *Quadrennial Defense Review* (2015, p.8)

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1. INTRODUCTION

A growing body of evidence shows that the world's ecological, financial and political systems are under increasing pressure, facing ever more uncertainties due to human impacts on the environment and ecosystems (Collier 2010; Collier 2008; Hallding, Nykvist, et al. 2013; U.S. National Intelligence Council 2012a). With rapid population and economic growth in much of the world, there are signs that continued demand for natural resources will exceed what is available under a business-as-usual development scenario (Hallding, Nykvist, et al. 2013). Critical ecosystems are approaching or exceeding their "carrying capacity" (del Monte-Luna et al. 2004), raising concerns about system disruptions with potentially complex, hard-to-predict consequences on society and the environment (Bierbaum et al. 2014; Jäger and Patel 2012; Steffen et al. 2004).

Increasing competition over resources – both within and among countries – heightens the risk of shortages, supply disruptions and price volatility, which may, in turn, contribute to rising political tensions (Lee et al. 2012). Thus, while the conventional discourse on security focuses on "hard security" (e.g. military threats, armed conflicts), there is a growing recognition of the need for a broader understanding of "security": one that also encompasses "human security" elements such as food and water security, environmental security, and overall well-being (World Commission on Environment and Development 1987; Dalby 2009; Matthew et al. 2010; Mobjörk et al. 2010; Scott Andersson et al. 2007).

Still, despite a recognition of the links and tensions between biophysical, political and economic domains (see CNA Corporation 2007; CNA Military Advisory Board 2014; Mobjörk et al. 2010), there is often a disconnect between those working on conventional security and those working on human security and sustainable development. The former focus on the state, while the latter focus on the individual and the community; different types of governance mechanisms are also involved. Different disciplinary traditions, methodological approaches and temporal interests reinforce the divide. For example, the state-centric security studies community generally tends to focus on countering direct threats to the state, emphasizing short- and medium-term security concerns. Those working on human security, meanwhile, typically have a longer time horizon, and look more broadly at risks and vulnerabilities to humans and ecosystems, with less attention to political delineations.

To bridge these different perspectives, this paper proposes an approach for integrated analysis using a tool common to both fields: explorative scenarios. By taking an integrative and forward-looking scenario approach, we capitalize on expertise inherent in both the sustainable development and the security communities for a better, shared understanding of challenges and opportunities for achieving robust development outcomes. This approach allows us to explore alternative analytical pathways that combine sustainable development issues at different scales and manage risks from multiple horizons and in the context of different actors.

The paper is structured as follows: Section 2 looks at the different framing of "security" and "sustainability", and how these could be reconciled. Section 3 presents three examples: the Middle East and North Africa (MENA) region, the Arctic and Central Asia, with a particular focus on issues at the intersection of water scarcity, natural resources extraction and regional security. Section 4 proposes a common framework for integrated analysis of the security–sustainability nexus, and Section 5 discusses the approach and its relevance to the three examples. Section 6 draws some conclusions for further work, analysis and applications.

2. INTEGRATING SUSTAINABLE DEVELOPMENT AND SECURITY

Perceptions of both security and sustainability are changing (for a good overview of the security concept, see Collins 2013). While they were once two distinct research fields, there is now a greater recognition of their interlinkages (Africa Center for Strategic Studies 2014; Hallding, Nykvist, et al. 2013; U.S. National Intelligence Council 2012b; Söderbaum and Granit 2014). A key driving factor behind this development in recent years is the increasing understanding of human-ecosystems dynamics, such as the impacts of climate change and variability, poverty and consumption on the Earth system over the last decades (Bierbaum et al. 2014; Steffen et al. 2004). In this section we explore how the reinterpretation and reframing of security and sustainability has highlighted the imperative of connecting the two to achieve robust development outcomes.

2.1 Unpacking sustainable development

The notion of sustainability rose to prominence on the global agenda at the first Earth Summit in Rio de Janeiro in 1992. The meeting built on debates catalysed by the Club of Rome's *Limits to Growth* (Meadows et al. 1972) and the Brundtland Commission's canonical definition of sustainable development: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development 1987, p.43). In this context, sustainability was framed as effectively balancing social, economic and environmental objectives in decision-making, and a systems approach to management and learning was encouraged. More recently, Earth system science has offered a similar perspective, starting from the realization that the Earth system is "a complex interlinking and interacting 'sphere' of processes and components, involving geosphere, hydrosphere, biosphere, atmosphere, cryosphere and most importantly, the anthroposphere" (Bierbaum et al. 2014, p.11).

The 2000 Millennium Development Goals (MDGs) Declaration took a tentative first step towards an integrated approach to sustainable development. It committed the global community to eradicate poverty by 2015, with shared goals on universal primary education, gender equality, reducing child mortality, improving maternal health, combatting HIV/AIDS, malaria and other diseases, and ensuring environmental sustainability – all within a global partnership for development. The MDGs' post-2015 successors, the Sustainable Development Goals (SDGs) approved by the UN in September 2015, set an even broader and more integrated agenda. Unlike the MDGs, which focused only on developing countries, the SDGs are universal, engaging countries at all income levels to achieve long-term well-being and to ensure that development is economically, socially and environmentally sustainable.

In the development discourse, the link between sustainability and security is typically made via the concept of human security, which encompasses well-being, food security, water security, and overall environmental security. This concept features prominently in the SDGs, but there is room for interpretation. Though they aim to be universal, the SDGs recognize that countries will need to take different actions to attain the goals, depending on country contexts and capabilities, both of which often serve to frame perceptions of human security. There is also an implicit recognition that the implementation of the SDGs will be affected by differing norms and ideologies across countries and regions.

Meanwhile, the private sector is increasingly recognizing the value of sustainability. The *Global Risks Report* by the World Economic Forum (2013) notes that inequality within and among countries is a growing source of instability (see also Ncube and Anyanwu 2012; Nimeh 2012). This instability could be exacerbated by critical trade-offs resulting from development objectives that run at cross-purposes and increase resource scarcity. For

example, competition over water for energy, food production and urban consumption can block development or force difficult trade-offs for governments and businesses.

Achieving sustainable development, it is thus argued, requires integration across sectors, with people at the centre; inclusive economic growth, equity and social development are also considered crucial for maintaining ecosystem goods and services (United Nations 2012).

2.2 Alternative framings of security

Since the Treaty of Westphalia in 1648 and the birth of the sovereign nation-state, the concept of security has revolved around the integrity of the state and its territory.¹ This conceptualization of security is what is usually called conventional “hard” security or national security. However, the understanding of threats to state security in the 21st century has expanded well beyond conventional thinking about invading armies and naval warfare, to include resource constraints, environmental degradation, and climate change and variability.

These factors can constitute very real and demonstrable impacts on state security. The hard security community refers to resource scarcity and stress, environmental degradation, and climate change and variability as threat or conflict “multipliers”. Although empirical evidence of direct causal relationship between environmental and resource issues and conflict is lacking, the defence and security communities recognize that environmental and resource issues degrade the state’s ability to deal effectively with threats to human security. This, in turn, can lead to economic stagnation, increase corruption and the flow of financial resources to insurgents, and exacerbate ethnic tensions (Liljedahl et al. 2012).

These threat multipliers pose potent risks to states’ viability and can make them fragile and lead to their collapse, as non-state actors who threaten the state exploit human misery and disenfranchisement for their own purposes. Indeed, the conditions they exploit stem in many cases from the loss of livelihoods and economic destitution due to environmental degradation and climate change and variability.

In order to ensure functionality and security, the state and its citizens need sufficient access not only to basic necessities such as food and water, but also to economic resources such as energy and minerals. Global trade has made it possible to ensure this access even when resources lie outside a state’s physical boundaries – indeed, many countries import a large share of their water and food. However, globalization, coupled with accelerating demographic change, has also increased competition over limited resources that are not evenly distributed around the world.

As noted above, the “human security” approach has created links between the security and sustainability communities. This approach has become increasingly influential in the conventional security community, similar to how the human rights perspective has influenced international law. Human security issues have become a factor in assessing the stability of governments and of the state itself. It is evident that this approach challenges the traditional state-based approach to maintaining the inviolability of state security from conventional threats (state-on-state warfare) and puts individuals and human well-being at the centre stage of security concerns.

¹ Harold Brown, U.S. Secretary of State from 1977 to 1981, defined national security as well as anyone: “National security, then, is the ability to preserve the nation's physical integrity and territory; to maintain its economic relations with the rest of the world on reasonable terms; to preserve its nature, institution, and governance from disruption from outside; and to control its borders” (Watson 2008, p.5).

It is interesting in this context to note that in its *Fifth Assessment Report*, the Intergovernmental Panel on Climate Change for the first time includes a chapter analysing security challenges due to climate change, taking a human security approach (IPCC 2014). This broad framing of human security is also found in the UN's definition: "the right of people to live in freedom and dignity, free from poverty and despair" (United Nations 2005). Notably, the human security discourse tends to focus particularly on conditions for poor and vulnerable populations (e.g. Matthew et al. 2010).

The acknowledgement of a broader security concept and its implications in/for the security community is a critical paradigm shift that expands the threat landscape to include those emanating from resource and climate issues as threat multipliers.²

2.3 Common characteristics

Research on sustainable development and security studies shares a number of distinct characteristics. Firstly, *both short- and long-term perspectives* are integral to the two research fields, albeit with different time-scales. Climate change is a prime example in the environment domain: the huge inertia of the climate system means that actions to reduce greenhouse gas emissions today will not reduce the severity of climate change impacts for another two or three decades (IPCC 2013). More generally, the concept of sustainability requires a longer-term perspective (although it is common for donors to assess development projects by some indicators for "sustainable development"). In the security field, where short-term perspectives are dominant, a long-term perspective is still crucial for understanding how threats develop over time (e.g. slow geopolitical shifts), and also for building capacity (e.g. long lead times in structural changes and in military equipment development and deployment). However, both research fields also include much shorter time scales, as exemplified in the security field by rapid shifts in tasking in the post-Cold War era.

Secondly, both fields often need to deal with *irreversibilities*. Failing to take adequate action today may make it too late to protect an ecosystem from the negative impact of climate change – and of course, it may be too late to restore the whole climate system. One extreme example is the extinction of species. In the security field, irreversibilities – such as war casualties – are a regular issue of concern when making decisions.

The third common characteristic is *uncertainty*. In the climate change context, Schneider (1983) developed the concept of a cascading pyramid of uncertainties, which depicts the "uncertainty explosion" as the aggregated uncertainties of future emissions levels, carbon cycle response, climate sensitivity and possible impacts are multiplied. Although climate change is particularly challenging due to large uncertainties, lack of predictability due to system complexities is common in the field of sustainable development. In security studies – as opposed to conventional risk analysis, where access to probability measures is assumed – uncertainty is the norm. Regardless of the conceptualization of security (see above), fuzzy system boundaries and systems complexities make security studies inherently uncertain.

² This, in turn, is altering military planning and operational response strategies, which now increasingly examine environmental and biophysical constraints as drivers of instability. As one example, the U.S. Department of Defense, through, e.g., the U.S. African Command (AFRICOM) and the U.S. Army Corps of Engineers, is helping countries considered to be key to U.S. national security interests with climate change mitigation and adaptation strategies. Another example is that a number of countries (mainly in the Organisation for Economic Co-operation and Development) have embraced the concept of human security in their foreign policy strategies (Debiel and Werthes 2006).

Finally, both fields deal with *multi-stakeholder problems*. Narrowly focused single disciplinary approaches are not likely to lead to progress in either field. Multi-faceted concepts such as security and sustainable development can be viewed in a multitude of different ways, and different stakeholders' perspectives and interests need to be taken into account. In short, these problems are trans-disciplinary in nature, which requires multi-stakeholder input from a variety of fields and disciplines.

Scenario methodology, brings together multiple stakeholders to explore alternative futures, is one approach that can address all four of the above issues. It is therefore no surprise that scenarios are used extensively in security as well as sustainable development research. A scenario methodology that integrates the needs from both communities, however, is still needed. In Section 4 we sketch out the basic structure of such an analytical framework, but first we present three examples that illustrate the complex interactions between sustainable development and security.

3. INTERPLAY OF SECURITY AND SUSTAINABLE DEVELOPMENT: 3 EXAMPLES

Innovative conceptualizations of security and sustainable development highlight new challenges for research and policy. It is clear that the recent past is not a reliable predictor of our geopolitical future. The examples presented here are regional examples in which key natural resources extend across national boundaries, and either states cooperate in bilateral or regional constellations, or conflict has arisen in the absence of effective cooperation. In Section 5, we will use these examples to show how our new scenario-based approach could support analysis, dialogue and investment towards sustainable solutions.

3.1 Climate change and water in the Nile and the Euphrates and Tigris regions

Several studies have identified climate change and variability – typically analysed in terms of changing rainfall and temperature patterns – as a potential threat multiplier and driver of conflict in Africa and beyond (Hendrix and Salehyan 2012; Hsiang et al. 2013; O'Loughlin et al. 2012). According to this small but growing body of literature, it remains difficult to draw generalizable conclusions from quantitative studies, given the importance of local economic and political context in determining impact, based on the capacity of countries and communities to adapt to climate change and variability (Bernauer et al. 2012; Fjelde and von Uexkull 2012; Hsiang and Burke 2014; Theisen et al. 2013). However, qualitative studies provide a great deal of detail. For instance, the Africa Centre for Strategic Studies (2014) notes that “sharp reductions in precipitation and concomitant temperature increases in parts of the continent have increased inter-group inequalities, raised the prospect of violent competition for diminishing resources and resulted in selective population shifts that could potentially foment insecurity”. The U.S. National Intelligence Council (2012b, p.iii), meanwhile, finds “many countries important to the United States will experience water problems – shortages, poor water quality, or floods – that will risk instability and state failure, increase regional tensions, and distract them from working with the United States on important U.S. policy objectives”.

Transboundary river basins cover almost half the Earth's land surface. They are critically important for multiple development outcomes, and require collective action to adequately supply both public and private goods from these shared resources (Granit 2012). The management of transboundary water resources is in itself a regional public good (Jägerskog et al. 2007) that has successfully avoided overt conflict (Wolf 1998). However, the U.S. Intelligence Community Assessment warns that manipulation of water resources in shared

basins may increasingly be used for leverage, even by terrorists, as water shortages become more acute beyond the next 10 years (U.S. National Intelligence Council 2012b).

The Nile region is a typical example of the complex dynamic between sustainability and stability. The Arab Spring has been a game-changer in terms of influence over water use in the region. All the riparian states see the Nile as vital to their national and human security and as a strategic component in foreign and state security policies (Eriksson et al. 2013; Waterbury 2008). Downstream, more than 80 million people in Egypt are critically dependent on the Nile for all aspects of society, while the upstream riparian states' development opportunities and social stability are closely linked to access to the Nile (Earle et al. 2010). Consequently, any alteration of Nile waters creates tensions, with political and economic responses and a risk of military action.

Over the years, the riparian states have signed a number of agreements and treaties, reflecting the governance priorities of the time (McCaffrey 2001). The Nile Basin Initiative (NBI), established in 1999 by a Council of Ministers of Water Affairs, defined a basin-wide framework to fight poverty and promote socio-economic development in the region. The NBI includes a strategic action programme comprising basin-wide capacity-building projects and the development and implementation of joint investment projects at the sub-basin level (Granit 2011). This process led to the signing of a basin-wide Cooperative Framework Agreement (CFA) in 2010 by six of the upstream riparian countries, with the objective of establishing a permanent river basin commission. Egypt and Sudan have not yet signed the CFA, as they perceive their historical water rights as insecure under the CFA (Salman 2014).

The Grand Ethiopian Renaissance Dam now under construction on the Blue Nile has caused severe regional controversy, highlighting conflict over unilateral versus collective action (Eriksson et al. 2013). The project is taking place in the context of a nascent basin-wide governance framework and, at the same time, significant political change in Sudan and Egypt. Sudan has been fragmented, with South Sudan becoming an independent state recognized by the UN. Since the Arab Spring, Egypt has undergone several regime changes. As a consequence, the balance of power among Ethiopia, Egypt and Sudan – the latter two not CFA signatories – has kept changing, and Ethiopia has emerged as the stronger regional player. Eriksson et al. (2013) have argued that a new compact on sustainable development is needed that goes beyond water security and include the elements of political change in the region, to ensure state and human security for all riparian countries.

The Euphrates-Tigris region, which includes Iraq, Iran, Syria and Turkey, is another example of transboundary river systems that are fundamental resources for the countries involved, providing water for energy, agriculture, industry, households and ecosystem services. Upstream hydropower systems interfere with the natural flow of the river, agricultural withdrawals reduce downstream water flows and pollute the water, and wetlands have been degraded, resulting in dust and haze storms (Granit and Joyce 2012). Historically and in recent times (c.f. the current conflict in Syria), complex linkages between geopolitics, economics and natural resource have created severe regional tensions, resulting in state insecurity and even collapse.

Water is inherently scarce in this region, and droughts, combined with poor management of natural resources and social and political factors, have intensified the problem. The result has been widespread poverty and joblessness, particularly in rural areas, which has driven the population into urban areas and resulted in severe human insecurity. This, in turn, has worsened ethnic and cultural tensions and caused deep mistrust among stakeholders. None of

these countries has been spared from turmoil, and in Iraq and especially Syria, the situation has become extremely severe, with millions of people now fleeing the violence.

Water has become a central aspect of the struggle between the Islamic State and the governing regime in Baghdad, where oil in eastern Syria and in central-northern Iraq, and the availability of electric power in both Iraq and Syria, are all in play (Coles 2015; Shakdam 2015). Resources, networks and commodities are used by the different adversaries to leverage power vis-à-vis one another in a complex set of conflicts, where resources are as much at stake in themselves, as they are tools to gain political control and longer term territorial influence. Water, oil, and electric power have become tactical assets that, if controlled by the Islamic State, render a strategic threat and tactical advantage on a transboundary basis depending on who controls them (CBN News 2014).

It is clear that the complex situations in the Nile and the Euphrates and Tigris regions are the consequences of more than just traditional national security and balance-of-power concerns. Increasing competition for energy, water and other natural resources, accentuated by the negative impacts of climate change and variability and compounded by growing demographic pressures and ethnic grievances all play a role shaping the wider security nexus.

The Arab Spring, with its demand for democratic reforms but, in Egypt, subsequent return to authoritarian rule, has had major impacts in the Middle East and the Nile regions. Similarly, the civil war in Syria and the sectarian violence in Iraq threaten regional stability as massive streams of refugees move into neighbouring countries and beyond, and as national and regional infrastructure and institutions falls apart. These challenges need to be understood in a wider context of links and tensions between sustainability and stability, environment and development. Policies and interventions in places such as the Nile and the Euphrates and Tigris regions must systematically address political, economic and governance realities that define the space within which development processes occur (Söderbaum and Granit 2014).

3.2 Different views on security in the Arctic

The Arctic is a very different example of the intersection of security and sustainability. Rapid change in the region has brought key issues to the forefront, including protection of sensitive ecosystems, the pursuit of energy and mineral resources, and control of Arctic shipping routes. Only a few decades ago, the Arctic was widely considered a distant, inaccessible place, “off-limits to all but the hardiest of explorers, frontiersmen, indigenous villagers, undersea subs, and isolated radar stations” and watched over by “two superpowers standing face-to-face across the icy polar region” (Zellen 2009, p.1). Even if the perception has always been quite different for those who call it home, the region was assumed to be inhospitable, and treated by much of the world largely with disinterest.

Now, nearly three decades after the end of the Cold War, the level and pace of change are dramatic, not least due to rapid changes in the physical environment. Climate change is raising temperatures in the Arctic at roughly twice the global rate of warming, with cascading effects, including shrinking glaciers, loss of sea ice, and the thawing of the permafrost (AMAP 2011). Ocean acidification is also increasing at a pace roughly twice what is being observed elsewhere due to the greater CO₂ uptake of frigid waters (AMAP 2003).

These changes affect both ecosystems and communities, and not only in the Arctic (Arctic Council 2013; AMAP, 2011; UNEP 2013). Increasing global resource demand is combining with changes in accessibility and new transport opportunities, and even geopolitical changes, to generate interest from far outside the Arctic. Significant worry tempers that interest, as the scientific community expresses increasing concern about how Arctic change may reinforce

feedbacks that amplify climate change (Sommerkorn and Hassol 2009). As one prominent Arctic scholar describes it, “the Arctic has become a highly dynamic socio-ecological system due largely to the interacting forces of climate change and a suite of factors that we commonly group together under the rubric of globalization. The result is a cascade of developments that are accentuating the links between Arctic processes and global systems and generating new needs for governance to maintain sustainable human-environment relationships in the circumpolar north” (Young 2010, p.164). In short, the Arctic is quickly being acknowledged as much more than an icy, often dark space to be monitored for largely military purposes.³

In the midst of this whirlwind of change, new forms of cooperation have emerged which transcend both national boundaries and conventional thinking about security. Much of this combined effort is channelled via the Arctic Council,⁴ which has become an important forum for international cooperation, not least among the eight countries whose territory extends above the Polar Circle. As one observer put it, “the Arctic is a place where cooperation is sought, indigenous peoples are respected, development is increasingly sustainable, and scientific research is supported and used in decision-making processes. It is a model of success” (Exner-Pirot 2012). While such unbridled optimism has never been universally shared – and has recently been dampened by the tensions between Russia and Ukraine – efforts to maintain cooperation under the Arctic Council as a space to meet, discuss and tackle common problems are clearly prioritized by all involved (Collins et al. 2015).

The shift away from the earlier hard security orientation to the Arctic that dominated into the mid-1980s is widely credited to Mikhail Gorbachev’s October 1987 “zone of peace” speech, in the then-Soviet polar capital of Murmansk (Gorbachev 1987). Characterized as “no less than revolutionary” (Purver 1988, p.148), Gorbachev’s speech catalysed a process of “de-securitization” (Åtland 2008),⁵ by urging action on a list of goals uncharacteristic of previous Soviet thinking – or of a conventional security mode of thinking. The list led off with making Northern Europe a nuclear weapons-free zone and scaling back all military activities, then pivoted to cooperation around resource development, Arctic scientific research, and cooperation on environmental protection (Gorbachev 1987). This represented a fundamental break with the then-dominant hard-security orientation of the Soviets and others (Purver 1988).

Although the initial international response was tepid, Canada and Finland seized the opening to set in motion a series of initiatives. The International Arctic Science Committee (IASC), for example, was founded in 1990, aiming to build bridges through scientific cooperation. In 1991, Canada and Finland led the creation of the Arctic Environmental Protection Strategy (AEPS). Environmental cooperation was of particular interest to Canada, as the problems caused by long-distance travel of numerous pollutants into the Canadian Arctic from industrial activity were becoming increasingly clear. The AEPS became the forerunner of the Arctic Council, which was established as an intergovernmental organization in 1996. The Arctic Council has been unique, not only for its pioneering efforts in Arctic scientific

³ For further research on contemporary security developments in the region, see Granholm et al. (2008) and Carlsson and Granholm (2013).

⁴ See <http://www.arctic-council.org>.

⁵ Åtland (2008) characterizes “de-securitization” as a process of moving issues into the sphere of normal political processes, in which the issues in question are the object of public discussion, debate and negotiation. The reverse, securitization, is a process of taking an issue out of the realm of open discussion and into the realm of “emergency” measures. De-securitization generally can be facilitated both by shifting issues into the more public sphere, and by shifting the proportion of public discourse toward the non-emergency mode.

cooperation, but also for its inclusion at the table of representatives of indigenous organizations (referred to as Permanent Participants) from across the Arctic.

In a more abstract sense, environmental and conventional security concerns coincide in the Arctic in at least four different ways:

- a) Energy security is central to modern economies, and the Arctic plays a major role in current and potential future supply of fossil fuels, with development ambitions often driven from outside the region, yet intersecting with both national and local security interests.
- b) Pollution generated by military activities, such as from chemicals and spent nuclear fuels, creates problems and risks (AMAP 1998).
- c) Food security and environmental security more broadly are prominent in the Arctic, linked to the impacts of pollution and climate change on individuals and communities (Arctic Climate Impact Assessment 2004).
- d) There is a broad fundamental security challenge of building capacity to respond effectively to change, especially to abrupt change and surprises (Kofinas et al. 2013; Arctic Council 2013).

In each of these instances, issues considered fundamental to sustainable development link directly to more conventional security concerns. These linkages provide openings for framing issues either in conventional security terms, or in the broader terms of sustainable development.

Åtland (2008) points to several tracks on which Cold War-era international relations in the Arctic were de-securitized and shifted to the broader forms of security embodied in sustainable development. Much of the process has taken place through the pursuit or realization of the kinds of goals enumerated in Gorbachev's speech, often through the institutional vehicle provided by the Arctic Council. De-securitization in this context was achieved in part by building and intensifying cooperation in areas where the direct threats were non-military, such as filling serious knowledge gaps about transboundary pollution and other environmental threats that especially affect wildlife and indigenous communities dependent on local food sources. The Soviets had also made slow progress on Arctic offshore energy projects, so cooperation and bilateral ventures offered the promise of sharing resources produced through successful ventures rather than enjoying 100% ownership of failed projects. Åtland (2008, pp.295–296) enumerates several conventional security issues also addressed by the shift of orientation. Military tensions were growing at the time, with U.S. and NATO military build-up under way in the region. Here, the response to military tension and threat was to seek a de-escalation rather than trying to answer the build-up in like terms.

De-securitization and the changing nature of international cooperation in the Arctic context raise important questions about governance in and of the Arctic. With a wide range of other interests no longer largely subordinated to national security concerns and chain-of-command decision-making, more participatory, democratic modes of governance are both needed and expected. The shift to "soft" security issues such as environmental protection, economic development and human well-being expands the range of issues that require broad stakeholder participation, as well as more inclusive rules and norms for identifying and defining common problems and their causes, and agreeing on appropriate course of action.

The Arctic Council has provided this sort of venue for just short of 20 years, with its relatively informal style well suited to its soft-law competencies and absence of legislative authority. Nevertheless, the fast-growing interest in the Arctic, combined with a significant increase in the number of Observer Countries (including countries such as China and

Singapore that are quite distant from the Arctic), is straining the more collegial modes of doing business. This and other challenges have contributed to substantial debate about where Arctic governance is headed – or ought to be headed (Koivurova and Vanderzwaag 2007; Koivurova et al. 2009; Koivurova and Molenaar 2009; Young 2009; Arctic Governance Project 2010; Young 2011; Axworthy et al. 2012; Young 2013). Increased discussion has also focused on the geopolitics of the region, including attention to security defined from a number of different perspectives (Huebert et al. 2012; Kraska 2011; Hoogensen et al. 2013).

These debates are intimately linked to the substantive issues that these various actors care about. As a result, the discussion of Arctic governance going forward occurs amid many different debates about the future and its payload of hoped-for opportunities and likely problems. This includes different stakeholders' substantive priorities, but also their understandings of how policy issues are most suitably identified, understood and prioritized, and how and where (and at what scale) decisions should be made and responses implemented (Folke et al. 1998; Folke et al. 2007; Alexeeva-Talebi et al. 2008; Galaz et al. 2012).

In summary, there has been a clear shift in the Arctic towards a more encompassing approach to security, institutionalized in the Arctic Council and its scientific Working Groups, and there is evidence of increasing engagement on the part of a wide variety of actors. While conventional security concerns are explicitly not within the purview of the Arctic Council – they remain the domain of national governments – the broad engagement of interested actors and the nature of the problems and challenges that are defined in that space continue to contribute to anchoring a broad approach to security. This trend persists despite increased tensions in recent years.

A second key point is that the nature of the problems being defined in and through Arctic Council activities inherently requires more participatory and democratic forms of governance. This stands in stark contrast to the more top-down governance structures favoured by conventional security interests. In the absence of a serious military crisis, the pairing of broad participation with issues that fall within a broader definition of security appears likely to be self-reinforcing.

3.3 Development in the post-Soviet space: Central Asia

Central Asia is another prime example of a region where the combination of environmental change and a complex security architecture highlight the need for linking conventional notions of security with a sustainable-development perspective. Central Asia, which includes the ex-Soviet states of Kazakhstan, Turkmenistan, Uzbekistan, Tajikistan and Kyrgyzstan, lies in a highly strategic position in the heart of Eurasia. What happens here has profound implications for the wider region, including Russia, China and the European Union.

Energy flows links Central Asia strongly with major players such as Russia, China and the EU. The energy sector is also a prime example of how environmental and security concerns meet. China, Russia and the EU are all big importers of oil and gas from Central Asia. In addition, the region has huge hydropower potential, and Tajikistan and Kyrgyzstan are keen to realize that potential. However, hydropower development could create conflicts between these countries and downstream countries that need water for agricultural irrigation. Russian plans for investment in this sector have been held back in part by worries that changing water flows could harm the country's relations with close neighbours, especially Kazakhstan (Granit et al. 2012).

Climate change, meanwhile, constitutes a serious threat to livelihoods in the region; recent research has focused on freshwater resources and agriculture in particular, with clear links to

human security. Climate change impacts such as rising temperatures and a decrease in precipitation in the western part of Kazakhstan, Uzbekistan, and Turkmenistan are expected to exacerbate the problem of water scarcity. This could be particularly challenging for regions where the economy is heavily dependent on irrigated agriculture. The UN Food and Agriculture Organization has warned of increasing concern about the impact of climate change in the region on water and energy security, particularly if there are not greater steps towards collaboration between countries over management of resources (Frenken 2013, p.72).

Glaciers are of immense importance for water supply in Central Asia, and all across the region, they are retreating. Research shows that shrinkage of the Central Asian glaciers is expected to increase as a result of climate change (Aizen et al. 2007; Marzeion et al. 2012; Radić et al. 2013). Huge losses of glacier area will influence downstream river runoff in these regions, and since most rivers cross national borders, there is a worry that this could lead to tension between affected states.

A recent study on global hotspots of heat stress on crops identifies Central Asia in the post-Soviet space as a particularly vulnerable region (Teixeira et al. 2013). The impacts of climate change on food production in Central Asia will vary, however: some regions could do better while others do worse. In the northern and eastern parts of the region, cereal production could benefit from warmer winters, a longer growing season, and a slight increase in winter precipitation. The western regions, such as western Turkmenistan and Uzbekistan, could experience more frequent droughts, with potential consequences for the important cotton industry. The expected impacts of climate change on agriculture in Central Asia may pose a major challenge to rural livelihoods, and it will affect food trade (Sommer et al. 2013). The effects could extend well beyond the region. Kazakhstan is one of the world's largest wheat producers, and the country not only plays a key role in the food security of the whole region, but also exports large volumes to Russia, China and worldwide. Uzbekistan, Turkmenistan and Tajikistan, meanwhile, are world leaders in the production and export of cotton.

The security architecture of the region is quickly changing. This was once a relatively stable part of the Soviet Union, and Russia, with several military bases in the region, is still the major player with regard to "hard security". Russia is also the main driving force within the Collective Security Treaty Organization (CSTO), a security organization currently consisting of Russia, Armenia, Belarus, Kazakhstan, Kyrgyzstan and Tajikistan. China is the main driving force in another regionally important organization, the Shanghai Cooperation Organization (SCO), a political, economic and military organization.

Meanwhile, the EU is striving to strengthen its links with Central Asian states, especially regarding energy flows. The EU strategy for EU–Central Asia relationships discusses security as a field which requires close cooperation, taking into account the region's geographical location, in particular with respect to Afghanistan, Pakistan and Iran (European Union 2009). Finally, even though the U.S. closed down its last military base in Central Asia in June 2014, it must be considered highly likely that the U.S. will maintain strong security links to the region.

In summary, Central Asia is a region with huge environmental and security challenges, and where four major geopolitical players – China, Russia, the EU and the U.S. – have interests that sometimes overlap and sometimes conflict. Hence, the case for integrated environmental and security analysis is strong (Liljedahl et al. 2013).

4. INTRODUCING A SCENARIO-BASED ANALYTICAL APPROACH

The examples above illustrate how a wider understanding of sustainable development and security can add value to analyses, particularly in regions with uncertain economic, social, political and environmental contexts. In this section we show how a three-step methodological framework, including exploratory scenarios, could help improve understanding of how security and sustainable development issues interact. This, in turn, can enhance our understanding of key challenges for successfully meeting security and human development needs.

In both the security and the sustainable development fields, there are many theories and methodological approaches for addressing subject-specific research questions or policy challenges. It is not the aim of this paper to replace those approaches, but rather to initiate the development of a framework that could be used as a common backbone for conducting such analyses in an integrated mode. The framework could thus support the assessment of sustainable futures, particularly in regions where development and/or hard security challenges are mounting. This would include post-conflict regions, and regions under mounting stress from environmental degradation, but may be appropriate in a wide range of settings.

4.1 Scenarios as a shared tool in sustainable development and security studies

Future studies is a research field that is difficult to grasp, and the literature contains a large number of different definitions and frameworks (Bradfield et al. 2005). One conceptualization is based on the main questions that may be posed about the future: What will happen? What can happen? How can a specific target be reached? (Börjeson et al. 2006) Another way to frame this is to ask whether the goal is to explore probable, possible or preferable futures (Amara 1981). Three types of techniques related to these questions and goals can be distinguished: *forecasting* (or trend analysis), *explorative scenarios*, and *normative scenarios*. Forecasting is typically used for shorter time-scales, when systems dynamics are relatively well understood. These techniques assume the broader context is relatively fixed, or has no influence on the dynamics of the system under study. Explorative scenarios usually cover longer time-frames, sometimes up to 100 years. They are built to explore plausible alternative development pathways that allow for assessment of a range of future conditions. Normative scenarios, also called “backcasting”, start with the future that is desired, then work backward to investigate possible pathways to achieving it. Policy scenarios are often normative.

All three approaches to scenarios are used in both security and sustainable development studies. However, here we focus on explorative scenarios, as they are most useful for addressing the four common characteristics of both fields discussed in Section 2.3: the need for both short- and long-term perspectives, the need to deal with irreversibilities, uncertainty, and the multi-stakeholder nature of many of the problems.

4.1.1 Explorative scenarios in sustainable development studies

The Millennium Ecosystem Assessment defines a scenario as a “plausible and often simplified description of how the future may develop, based on a coherent and internally consistent set of assumptions about key driving forces” (Millennium Ecosystem Assessment 2005, p.214).⁶ This definition is typical of how explorative scenarios are used in the broader sustainability context (Rounsevell and Metzger 2010), from the global, to the regional, to the

⁶ Implicit in this definition is that one works with a few scenarios; there are alternative approaches that utilize a huge numbers of scenarios (Groves and Lempert 2007).

local level. The most prominent scenario process at the global level is perhaps the IPCC work to develop the *Special Report on Emissions Scenarios* (SRES – Nakicenovic et al. 2000). In this process, explorative storylines were constructed to describe main characteristics of different greenhouse gas emission scenarios. For its *Fifth Assessment Report*, the IPCC used Representative Concentration Pathways (RCPs) to support quantitative analysis, but it again developed explorative storylines to describe the conditions that might lead to different emissions outcomes; here they are called *shared socioeconomic pathways* (O'Neill et al. 2015). Exploratory scenarios have also been used in numerous other studies – for example, to analyse national environmental objectives (Höjer et al. 2011), environmental policy options (Svenfelt et al. 2010), climate change impacts (IPCC 2014), and adaptation options (Baard et al. 2011; Carlsen et al. 2012; Kok, Patel, et al. 2006; Kok, Rothman, et al. 2006).

4.1.2 Explorative scenarios in security studies

Scenario planning originated in World War II-era defence planning, so it is not surprising that there have been numerous applications of scenario methodologies within the security field, mostly conducted by governmental agencies and think tanks. Examples include the reports on global trends by the UK Ministry of Defence (2014) and the U.S. National Intelligence Council's *Global Trends 2030* (2012a). It is of particular interest to note that the U.S. Department of Defense commissioned a scenarios-based study to gauge the possible implications for U.S. national security of abrupt climate change (Schwartz and Randall 2003), which subsequently led to a series of regional in-depth studies by the Pentagon.

An appropriate starting point for discussing the explorative scenario in the security realm, and especially with a human security perspective, is the Mont Fleur Scenarios developed in South Africa in the 1990s in connection with the country's transformation after apartheid (see Galer 2004). These scenarios were developed in a multi-stakeholder problem-solving process that included workshops with representatives from the business sector, the political sphere and civil society. Segal (2007) finds that both the process and the scenarios helped to foster a productive discussion about South Africa's future that went beyond the prevailing paradigms.⁷

4.2 A scenario-based analytical approach for comprehensive analyses

The scenario-based analytical approach is designed to increase knowledge about how different actors frame and understand challenges, to facilitate the identification of joint challenges, and to identify new research tasks and policy options that emerge from a broader understanding of those challenges.⁸

The framework consists of three basic building blocks:

1. Context analysis;
2. Participatory scenario building; and
3. Options appraisal to identify investments, e.g. in institutions and infrastructure.

⁷ Scenario-based studies typically examine the long-term development of external socio-economic factors of importance for national or transnational security. There are fewer studies from academic research using scenarios. This is perhaps mainly due to a lower interest in future-oriented research among academic researchers compared with the more policy-oriented community.

⁸ The approach we describe below was applied in the analysis behind the report *Sweden in a World of Growing Uncertainties* (Hallding, Eriksson, et al. 2013), where the robustness of green economic policy was assessed in relation to a set of contrasting global scenarios.

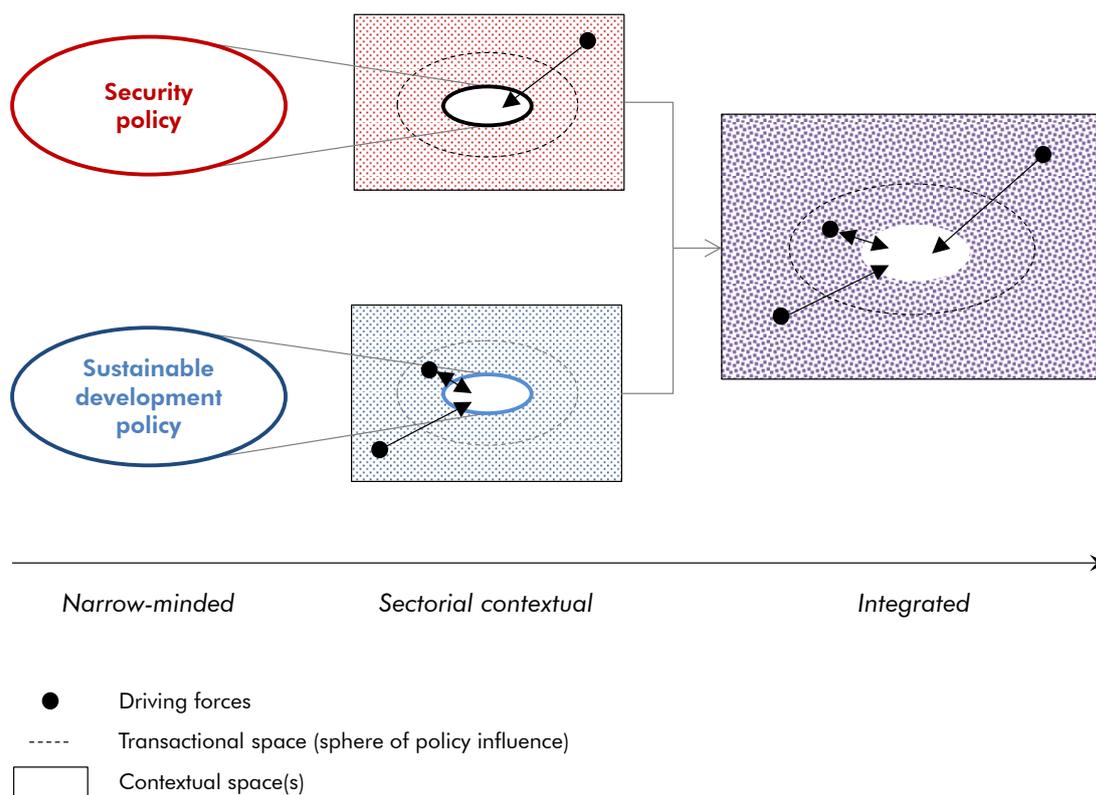
4.2.1 Context analysis

It is well appreciated that policy development does not happen in a vacuum, but few policy guidance tools systematically consider the surrounding context, or “space”. For example, both security and environmental policy depend on a number of external drivers and their interlinkages. A simple model developed from Emery and Trist (1965) describes the reach of influence of a given policy actor in two types of “space”:

- The *transactional space* is the realm in which the actor interacts with other actors and driving forces. This is where the actor has the power to influence the course of future developments, but where the range of options is influenced or conditioned by how other actors chose to play their cards.
- The *contextual space* is the realm beyond the transactional space. Here the policy-making actor no longer exerts any noticeable influence, but developments in this space may also have a significant impact on the actor’s ability to attain policy objectives (Van der Heijden 2011).

We can use this model to illustrate a possible shift from “narrow-minded” policy development, to a “sectorial contextual” approach, and ultimately to “integrated” policy development, as shown in Figure 1. “Narrow-minded” policy-making in security and sustainable development does not take the wider external context into account. Of course this is a crude simplification; policy-making always includes *some* consideration of the external context. “Sectorial contextual” policy-making draws on the Emery and Trist model in which the two policy processes are situated within their respective transactional (dotted oval) and contextual space (outer box). In addition, the policy processes are linked to various driving forces (black dots): within the transactional space, policy can influence and be influenced by driving forces; within the contextual space, the influence is one-way. Here, policy-making in the two fields is contextualized, but remains sector-focused, i.e. the policy process acknowledges external drivers, but only within the field under consideration (security *or* sustainable development). “Integrated” security and sustainable development policy-making takes into account the contextual and transactional spaces where both environmental, development and security *driving forces* (black dots) are incorporated in the analysis. Our analytical framework is designed to facilitate this sort of contextualized policy-making, where development/environmental and security factors are entangled. The next building block – scenario-building – is initiated by this context analysis.

Figure 1: Moving towards ‘integrated’ policy development



4.2.2 Participatory scenario-building

In this stage, we build scenarios to explore possible pathways for the development of the contextual and transactional spaces. Here it is important to provide a focal question for the scenario-building process. The building blocks of the scenarios are called *driving forces* (see black dots in Figure 1) and consist of development/environmental and socioeconomic drivers, trends or other potential change factors. These driving forces can be identified through a combination of literature studies, interviews and workshops with stakeholders (Briggs 2013; Hines 2002).⁹

The scenarios are constructed by first prioritizing the most uncertain and most important driving forces (“what is important in relation to the focal question?”). It is evident that the scenarios should focus on describing the relationship between the most important forces. Focusing also on uncertainty increases the likelihood that the scenarios as a set cover a broad range of possible futures and hence enhance the identification and assessment of resilient development options. The scenarios should be chosen so that they are relevant, plausible and challenging, and they meet the demand of the stakeholders. This “scenario logic” can help reduce the number of possible scenarios. Finally, the scenario sets chosen should be written as

⁹ Here participatory methods like structured workshops are particularly useful, since it helps facilitate interaction as well as establishing legitimacy for the scenario process as well as the product, i.e. the explorative scenarios. When working on transboundary development policy, e.g. indirect impacts of climate change or water management, stakeholder participation is especially important.

narrative text, typically not longer than 500–600 words and validated with the stakeholders. Between three and five scenarios should be constructed.¹⁰

4.2.3 Options appraisal

The ultimate goal of the analytical approach described here is to support long-term policy-making for sustainable development in its broadest sense (i.e. encompassing hard and soft security). This comes into play in the third stage of our approach: the introduction of “options for action”. There are different types of options; for example, they can be classified as investments and institutional development (Eggertsson 1990). An example of an investment option might be to improve water supply infrastructure to support hydropower and irrigation. Institutional development options could be new legislation or educational programmes. Options could also be classified by sector: e.g. options within the water sector, buildings, ecosystems, education, etc.

At this stage it is important to stress the different types of actors that are involved, explicitly or implicitly, in a process towards sustainable development. As noted in the introduction, the aim of this paper is to lay the groundwork for the development of a methodology for integrated analysis of sustainable development and security. This could mean development of policy instruments, for example, but it could also include the development of business strategies or strategies for different types of non-governmental organizations. The methodological foundations discussed apply to all those actors. In a security setting it is of course also important to mention the growing role of violent non-state actors.¹¹ Hence, the notion of institutional options should be interpreted very broadly, potentially to include measures and instruments to deal with violent non-state actors.

The identification of options is based on the explorative scenarios developed in the previous stage. The three to five scenarios should produce different ideas of what options are feasible given the description of future development in the scenario. The identification of options is preferably done in a workshop setting, to facilitate the generation of ideas and maximize creativity as stakeholders with different experiences and backgrounds collaborate to interpret a future context provided by a scenario.

The next and final step is the assessment of options against the range of possible futures, i.e. the scenarios. It is rare for a decision-maker to consider *one* decision (option) against a range of possible future outcomes. In almost all real situations, decisions are bundled together in “portfolios”, so the options identified above should also be combined into different “portfolios of options”. It is these portfolios that should be assessed against possible futures.

The number of possible portfolios increases very rapidly with the number of options identified; hence a selection must be made. This selection should be based on some criteria. An important aspect here is to study the variance and the co-variance between the options in different possible portfolios.

When assessing the robustness of portfolios of options the scenarios are used again. Now the scenarios act as a test bench for the different portfolios (“stress-testing”). The assessment of the portfolios can be performed via a number of different methodologies. The simplest

¹⁰ This short section only provides a very basic description of the scenario building process. For a more elaborated description along the line discuss here, see Carlsen et al. (2012).

¹¹ In some contexts, non-state actors are only interpreted as violent non-state actors. Most scholars would agree, however, that the term “non-state actors” is broader and includes, e.g., multinational corporations and NGOs.

analysis involves the assignment of qualitative judgements of *pros* and *cons* for each of the portfolios in each of the scenarios. It is also possible to let stakeholders assign *pros* and *cons* via a quantitative scale from, say -3 to $+3$. More elaborate approaches involve the utilization of e.g. cost-benefit analysis, multi-criteria analysis, or strategic, sectorial, environmental and social assessment (Granit et al. 2011).

5. APPLYING THE INTEGRATED FRAMEWORK

The starting point of this paper is that conventional notions of security and sustainable development are no longer adequate in many contexts, and an integrated approach is needed. The world's ecological, financial and political systems are under increasing pressure due to human activities, and new security threats are arising that go beyond traditional interstate armed conflict and relate to natural resources constraints, ecosystem degradation, and climate change. As noted above, scenario analysis is widely used in both the sustainable development and the security fields, but the two fields differ in the time horizons normally considered. Sustainable development studies tend to take a longer view, and treat political and economic factors more or less as static, while the security research community typically looks at shorter time horizons and considers political and economic factors as dynamic. The analytical framework presented in this paper aims to bridge the gap between both fields, to allow consideration of multiple driving forces at once and identify options for creating more sustainable, prosperous and secure societies.

5.1 Understanding the wider political, economic and environmental context

As discussed in Section 3.1, the ongoing construction of the Grand Ethiopian Renaissance Dam (GERD) on the Blue Nile, a project that aims to enhance energy security and economic development in the Upper Nile Basin, has met with strong resistance from downstream riparians. It is argued that a new compact on sustainable development needs to account for the elements of political change in the region and ensure state and human security for all the riparian countries. In Ethiopia, where the GERD is being built, it is viewed as the centrepiece of rising economic prosperity; both Sudan and Egypt, however, view it in zero-sum, balance-of-power terms, against the backdrop of their own respective internal political upheaval and change. A more inclusive perspective could shift the debate away from this narrow (and negative) appraisal towards a focus on the potential economic development benefits in which all riparians could share. These points are not intended to validate or invalidate the GERD project itself, but to illustrate the inherent value in taking a more robust, inclusive analytical approach. Therefore, political, economic and societal (demographic) variables need to become included as rigorous steps in development assessment, planning and implementation of the GERD in the Nile Basin and elsewhere. Such an approach can, for example, identify the benefits of more regionalism for all parties concerned (Söderbaum and Granit 2014).

The Euphrates-Tigris region, covering Iraq, Iran, Syria and Turkey, is another example of transboundary water resources that are critical for energy, agriculture, industry, households and ecosystem services. The river systems bind the four countries together, but the region is also an active conflict zone, with civil war in Syria and activities by non-state actors such as ISIS that threaten the stability of Syria, Iraq and possibly others. Both states also struggle with water stress, and now water infrastructure and resources are deliberately being used as tactical weapons.

Much of the water and power infrastructure across the region has been destroyed and will need to be rebuilt after the conflicts end. The approach presented in Section 4 could support positive change. Rebuilding infrastructure and ensuring the future sustainability of water and

energy systems and ecosystems across the region will require bringing together disparate groups that may nonetheless have common needs and similarities. A systematic assessment of the political, social, religious and ethnic dynamics in the region is needed to gain a better and more robust understanding of the operating environment in which future options such as reconstruction and development will occur. If this track is pursued, development outcomes will have a greater probability of success, as they will reflect the realities on the ground.

The Arctic is a striking example of a region where climate change is directly reshaping the entire geophysical and geopolitical landscape. Accelerating global resource demand, against the backdrop of significant melting of the Arctic cap, drives a stronger interest for natural resources extraction and more efficient transport opportunities, placing geopolitical change at the forefront. Political stakes are rising across the region, and this has created a substantial debate about Arctic governance. An analytical lens based on critical geopolitics and ecosystem challenges can serve as a tool for unravelling the political dynamics set in motion by this new situation. Based on a shared understanding of the context, the dialogue among the Arctic states can be reshaped to focus on prospects for cooperation, exploring win-win scenarios for both the people and the environment of the region and setting the scene for the analysis of robust and acceptable governance options.

In Central Asia, the collapse of the Soviet Union resulted in the emergence of five new states: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, all former Soviet republics. During the Soviet era, these five states cooperated on water and energy and had transfer schemes in place for the flow of these resources. Now the countries face major environmental degradation in the Aral Sea basin due to overuse of water resources (primarily for irrigation) and climate change, and this is reducing opportunities for food and energy production. Unilateral action to develop hydropower has caused tensions between upstream and downstream riparians. In parallel, the security architecture is quickly changing. Russia is still the region's major player with regard to "hard security", but China, the EU and other key players have taken stakes in the region's development as well. It has been proposed that the water, energy and food nexus framework could be an entry point for a systems analysis to identify investment options for sustainable pathways in the region (Granit et al. 2012). Such an approach could be carried out under the analytical approach proposed in this paper, focusing on strong context analysis from multiple perspectives to tackle development and security, participatory scenario-building, and options appraisal.

5.2 The use of scenarios

Considerable attention has been given to the value that scenarios can play in examining future sustainable development pathways or in charting a way forward on desired normative outcomes. Earlier we offered prominent examples of scenario development in both the sustainability and the security fields, namely the IPCC *Special Report on Emissions Scenarios* and the Mont Fleur Scenarios developed in South Africa in the 1990s.

Highly relevant in both cases is the multi-stakeholder participatory approach, which is critically important for assessing the impacts of various policy changes and development options. The methodology presented in this paper provides a framework that can be used as a common backbone for conducting analyses in an integrated fashion.

Global environmental change affects actors' perceptions of security and risk, and their preferred measures to enhance security. A cross-scale geopolitical analysis can help identify synergies and conflicts in risk perceptions and resulting policy responses. An integrated analytical approach to explore sustainability and security requires collaboration and learning

between social and natural scientists embedded in the development community, along with planners, tacticians, strategists and logisticians in the defence and security communities. This is not easy. For example, environmental researchers tend to assume a rather stable geopolitical setting and thus fail to incorporate the environmental ramifications of possible changes in international affairs and the wider political economy. Meanwhile, security policy analyses have only recently – and to a very limited extent – started to consider the effect of environmental changes on security concerns.

5.3 Moving towards tangible options

Granit and Claassen (2013) is an example of work to identify investment and institutional options in a region. The methodology is framed by and for riparian countries working together in a transboundary river basin context to achieve tangible development outcomes. It builds on structured approaches to evaluate, assess and agree on the potential impacts – positive and negative – of different options. This approach is based on a participatory analysis with relevant stakeholders, by looking into the future using more standard macro-economic forecasts rather than participatory scenario-building. Critical in this process is that all riparian countries should have access to the same information to evaluate the benefits and trade-offs of cooperation. Such approaches can allow for informed decision-making and agreement on next steps towards development, ideally within a shared vision created through an exploratory scenario process. Such a modelled approach, driven by context-specific analysis, capitalizing on multi-stakeholder participatory inclusion, and channelled through exploratory scenario frameworks, can be practical and focused on tangible investment opportunities.

6. CONCLUSION

In a fast-changing geopolitical landscape, issues of state and human security will increasingly need to be assessed together, as they are closely interconnected. The examples from the Nile, the Euphrates and Tigris, Arctic and Central Asia regions illustrate this phenomenon. To identify options for achieving a more sustainable and secure future, this paper advocates the systematic, integrated evaluation of variables that are important to both the security and the sustainable development communities. The objective is to enhance development outcomes, contribute to peace and stability, and find effective solutions that are sustainable over time.

Consideration of the political, economic and social factors that frame and shape the operating environment for development is long overdue. It must be systematically integrated into development assessment, planning and response strategies. Similarly, factors ranging from resource scarcity, to competition over critical commodities, to climate change and ecosystems degradation can all affect human behaviour and trigger or multiply instabilities which threaten peace and stability. These factors should be systematically considered in defence and intelligence assessments, strategies and planning. It is therefore the *systematizing of this integrated approach* that is essential to address human development, peace and security. To date, integrated analysis has either not occurred, or occurred on an insufficient scale to produce meaningful improvements in development outcomes or more inclusive strategic foresight.

A more dynamic and interlinked context analysis that provides broad perspectives on development and security will be crucial for achieving transitions towards sustainable development in its broadest sense. Such an integrated analysis, drawing on multiple disciplines, sets the scene for participatory scenario-building. In turn, such stakeholder-driven scenario processes will support the identification and appraisal of options related to governance and tangible investments. This analytical framework can be replicated to address complex development challenges across regions. It is an approach that can be applied in pre-

conflict, in-conflict or post-conflict contexts, and anywhere that innovative approaches for exploring robust and sustainable futures are sought. While the consideration of specific variables or resources may change by context, the approach remains the same and can be constant to allow for follow-up and learning by involved stakeholders.

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