Migration and displacement risks: connecting dots, understanding trends

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Abstract

Migration and displacement are history's oldest and recurring human responses to changing environments, either from social, environmental, economic, or political pressures. Today, the world's growing population is increasingly exposed to more frequent and multidimensional risks, and the scale of human flows, both internal and cross-border, temporarily or permanently, is expected to rise. Concurrently, a complex interplay between different factors is inducing migration and displacement, including economic inequalities, social intolerance, human rights transgressions, conflicts, environmental change, and inadequate governance structures and processes. Such human mobility is often wrongfully perceived as a failure to adapt with rapidly changing and increasingly uncertain systems, rather than seen as a tool for relocation and a coping mechanism in an effort to maintain dignity and freedom of opportunity towards fulfilling sustainable livelihoods. Just as disasters from hazards may drive human mobility, the incoming and outgoing mass movement of people may also significantly affect areas where migrants originate from, transit to, as well as in their final destinations. Migration and displacement, climate change and social stability are a complex nexus that needs to be addressed in a holistic and interdependent manner in order to achieve the aspirations laid out in various intergovernmental sustainable development frameworks (e.g. 2030 Sustainable Development Agenda) and to inform future compacts (e.g. Global Compact for Safe, Orderly and Regular Migration to be adopted at an intergovernmental conference in December 2018). Deeper understanding the various types of stresses people face across their unique migratory paths will provide insight into how to better mitigate and respond to uncertainty, while addressing root-cause, systemic, and emerging issues that will continue to challenge principles of resilience and sustainable development for all.

1.   Introduction

Human mobility, a term that encompasses migration and displacement, is a phenomenon that has been occurring throughout history, driven by a complex interplay between social, economic, environmental, political and cultural factors (Forest and Hagen-Zanker, 2017). For instance, people have always moved as a response to changing environmental conditions or security issues due to conflicts. Acknowledging the variety of definitions, in this article we refer to *migration* as   a process of voluntary movement within or across borders, temporarily, seasonally or permanently, whereas *displacement* is defined as an involuntary and forced movement within or across countries' borders, (UNISDR, 2018; Forest and Hagen-Zanker, 2017).

In the 21st century, migration and displacement contribute to shaping different components of economic and social development and is hence one of the key aspects of achieving the Sustainable Development Goals (Opitz-Stapleton, et al, 2017). According to the International Organisation for Migration (IOM, 2018), the importance of migration and displacement as a policy issue has never been more pronounced and there is an increased need for data-driven and evidence-based approaches that would allow for development of risk-informed strategies. Available data shows that at present, there are 258 million international migrants worldwide (UNDESA, 2017), 768 million internal migrants (Bell & Charles-Edwards, 2013) and 68.5 million forcibly displaced people (UNHCR, 2017). The Internal Displacement Monitoring Centre (IDMC, 2017a) reported that in 2016 alone, there were 6.9 million new cases of internal displacements by conflict and violence, and another 24.2 million by disasters; in total these numbers equal to an average of one person displaced per second. The impact of such mass movement of people varies greatly across geographies and economies. For instance, small island states, low and lower middle-income countries suffer disproportionally due to their low coping capacity, high levels of socio-economic vulnerability, and high exposure to natural and human-made hazards (IDMC, 2017a). In addition, it is important to acknowledge that the reported numbers depend on what is defined under the terms of *migration* and *displacement*, and that reported numbers may vary according to the analytical tool employed, and as such, the global human mobility picture must be seen as a sum of many parts (IOM, 2018).

The drivers behind migration and displacement are complex and interrelated. According to Van Hear, et al, (2012), drivers can be grouped under predisposing (e.g. broad processes such as globalization, environmental change, urbanization, demographic change), proximate (e.g. decline in economic cycle, security threat to human rights), precipitating (e.g. financial collapse, natural hazards), and mediating (e.g. transport, communication and

information) drivers. Human mobility drivers are highly dependent on the localized context and can interact in different ways (Black, et al, 2011a). For instance, climate change can be a contributing factor in initiating conflict situations or can aggravate existing displacement situations (UNHCR, 2017). The interplay between different drivers of human mobility is evident in disaster situation. People's vulnerability to disasters is shaped by underlying political, economic and social processes and is exacerbated by climate change.

According to the latest IDMC report, on average, 7.35 million new displacements - both within or across countries' borders- occurred in the last 10 years as a result of conflict, or generalized violence. In comparison, new displacements due to disasters were, on average, more three times higher than due to conflicts (IDMC, 2018). Forced displacement causes enormous burden to areas where people originate from, transit to, as well as in their final destinations, particularly for the poorest and most vulnerable including youth, women and children. In future, this number is likely to rise. Recent studies indicate that without concerted climate and development action, climate change could push tens of millions of people to migrate within their countries by 2050 (Rigaud, et al, 2018). This raises questions for climate change adaptation strategies, both in terms of supported migration as an adaptation option, and of the need to support recipient communities to integrate new arrivals.

The current patterns of global migration and displacement have heightened a growing understanding that an innovation gap exists in addressing social issues within the humanitarian sector (Ahmed, et al, 2016). Understanding the scale of migration and displacement and the patterns of people's movements, as well as their drivers, associated risks and trends is critical to governments. Consequently, improved evidence is needed to enhance our ability to anticipate risks, better prepare and respond to early warning indications of migration and displacement. Reliable data is central to achieve robust development plans at the global, national and regional scales, and data-driven tools and methods are increasingly important to mainstream migration and displacement into evidence-based actions for a resilient future.

Given the complex interlinkages between human mobility and sustainable development and the recognition that both the challenges and opportunities to address them differ across contexts and timelines, this article seeks to discuss the complex nexus between migration and displacement, climate change and human security (section 2), and its implication on the achievement of the 2030 Sustainable Development Agenda (section 3), the Sendai Framework for Disaster Risk Reduction 2015-2030 and other post-2015 agendas (section 4). We reflect on how human mobility is addressed across development agendas; discuss associated risks related to

migration and displacement processes; and highlight future steps and innovative tools available for monitoring them (section 5).

2.   Setting the scene: Climate change, disasters, migration, displacement and security

Over the last decade we have seen a heightened interest in the potential implications of climate change and disasters on international security and stability. This so-called "securitization" (Buzan, et al, 1998) has transformed climate change from a purely environmental and developmental concern into an issue that warrants attention by foreign policy, security and military actors (Peters and Mayhew, 2016). In unpacking the intermediary factors which shape the relationship between changes in climate and conditions of conflict, migration and displacement feature as a central theme, and have been ever since the first UN Security Council debate on climate change in 2007[1].

In an increasingly securitised climate change discourse (Peters, forthcoming), migration has been used to unpin the plausibility of claims that climate change leads to instability. For example, the first UN Security Council debate on climate change in 2007 included the notion that climate change and disasters may induce migration – which in turn it was argued as a potential risk to stability within states, particularly in areas of scarce resources[1]. In the second UN Security Council debate on climate change in 2011, then UN Secretary General Bann Ki Moon warned that displacement as a result of climate change was "reshaping [the] human geography of the planet" and, along with other potential risks, threated international peace and security[2].

This so-called "securitisation" continues up to 2019 (the time of writing), perpetuated by the media and "speech acts" in international dialogues – including in the 2017 Arria Forumla meeting[3], resolution on Lake Chad[4], and 2018 UN Security Council debate[5,6]. Displacement and migration have also been attributed to climate change

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[1]UNSC. 2007. 566 3rd Meeting. S/PV.5663. Available from: http://www.un.org/en/ga/search/view_doc.asp?symbol=S/PV.5663

[2]UNSC. 2011. 6587th Meeting. S/PV.6587. Available from: http://www.un.org/en/ga/search/view_doc.asp?symbol=S/PV.6587
[3]Confidential meetings exploring topics relevant to the UN Security Council.
[4]UNSC. 2017. Resolution 2349 (2017): On the Situation in Lake Chad Basin Region. (31st March 2017) [Online]. S/RES/2349. [Accessed 9th August 2018]. Available from: https://www.securitycouncilreport.org/atf/cf/%7b65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7d/S_RES_2349.pdf.
[5]Mohammed, A. (2018) Impacts of Climate Change Go Well beyond 'the Strictly Environmental', Deputy Secretary-General Tells Security Council Debate. 11th July 2018. Available from: https://www.un.org/press/en/2018/dsgsm1195.doc.htm
[6]UNSC. 2018. 8307th Meeting. S/PV.8307. Available from: http://www.un.org/en/ga/search/view_doc.asp?symbol=S/PV.8307

in a number of national security strategies, particularly across Europe including the United Kingdom (HM Government, 2015), France (Ministere Des Armes, 2017), and Germany (Federal Ministry of Defence, 2016).

2.1 A contested narrative

There has been a backlash; in part, as a response against the demonising of those vulnerable to climate change as the "security threats" themselves; attempts to securitize migration have been labelled as "morally dubious", with concerns that the discourse may be used to legitimize a hardening of policies impacting on the safety of migrants, by making migration illegal, irregular, unsafe and exploitable (Mobjork, et al, 2016).

The Stockholm International Peace Research Institute argues that although large scale unplanned migratory movements occur and have an impact on societies, migration should not be defined as a national security issue; citing a lack of robust and credible evidence, emphasizing that it may be those migrating who face the security risks (ibid). Indeed, in the context of conflict in Africa, researchers are increasingly warning that "intervening variables determine if and how environmental change causes population movements and political violence" (Freeman, 2017).

Despite politicking and a securitising discourse on the international stage, a limited evidence base (van Schaik and Bakker, 2017) has led to a growing underlying recognition that, if connections are to be postulated on the relationship between climate changes, migration, displacement and conflict then these are highly context specific (Burrows and Kinney, 2016).

2.2 Trend: The shift from national security to human security

The evidence and discourse on climate change, migration and security has evolved over the past two decades, from a focus on national security to one of human security. And with this, a "softening of tones", where discussions on climate migration have shifted to focus on the concept of human security - as noted by the IPCC 5th Assessment Report (Adger, et al, 2014) - and migration as an adaptation strategy. For example, the 5th IPCC Assessment Report included migration within the chapter on human security, stating that there is "medium evidence" and "high agreement" that "climate change will have significant impacts on the forms of migration that compromise human security" (ibid: 758). The IPCC also stated that migration and mobility are important forms of adaptation to reduce "vulnerability to climate change and enhance human security" (ibid).

This raises questions for climate change adaptation strategies, both in terms of supported migration as an adaptation option, and of the need to support recipient communities to integrate new arrivals (Opitz-

Stapleton, et al, 2017). It also raises questions about "immobility" for those without the means or option to move (Wilkinson, et. al, 2016).

2.3 Securitisation has diverted attention from the pursuit of climate change adaptation and disaster risk reduction in contexts affected by conflict and fragility

Arguably, the over-emphasis on the links between climate change and security, and the use of disasters within a securitised climate change narrative (see Peters, forthcoming) has drawn attention away from the challenge of understanding and acting on climate change adaptation and disaster risk reduction (DRR) in contexts affected by conflict and fragility (Peters, 2018; OECD, 2018). As Black, et al, (2011b) argue "political instability, poor governance, conflict and social pressures" compound migratory risks; as was the case in Zimbabwe, where drought, political and economic crisis contributed to a large rural migration to South Africa – estimated up to 2 million between 2000 and 2011 (ibid). While efforts have been made to draw attention to the need to tailor climate change adaptation interventions and investments to contexts of conflict (See Rüttinger, et al, 2015), and similarly of DRR to contexts of conflict and fragility (see Peters, 2017), progress has been marginal.

3. Migration and displacement and the 2030 agenda for Sustainable Development

As previously mentioned, human mobility, climate change and the environment are interrelated, and their potential link with conflict is often viewed by policy makers as a security issue (Chirico, 2017). To guide climate actions towards a more resilient future, effective policy action is undoubtedly needed. Therefore, for laying a new trajectory for sustainable development that broadly maintains balance between the social, economic, and environmental dimensions, in 2015, UN member states adopted the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs). Governments, along with a number of critical segments of society (e.g. business, NGOs) and rights-holder groups (e.g. women, indigenous people, etc.) collectively referred to as Major Groups and Other Stakeholders, and the larger United Nations system have been mobilizing efforts to achieve it. Universal, inclusive and indivisible, the 2030 Agenda calls for action by all countries to improve livelihood of people everywhere.

In order to fulfil the main goal of "leaving no one behind", it is necessary to take into account the numerous and complex interlinkages, tradeoffs, and reinforcements between the SDGs by balancing the three

dimensions of sustainable development: the economic, social and environmental. Among others, poverty, environmental degradation, and conflict are key drivers of both internal and international migration and displacement; with migrants facing multifaceted risks that should be addressed as part of the implementation of the Agenda, putting special attention on human rights and gender equality. Beyond the 2030 Agenda's principle of leaving no one behind, migration and displacement are directly relevant to all SDGs. In Figure 1, we illustrate how internal displacement interlinks with the 17 Sustainable Development Goals.

1 NO POVERTY	**2 ZERO HUNGER**	**3 GOOD HEALTH AND WELL-BEING**	**4 QUALITY EDUCATION**	**5 GENDER EQUALITY**
Internally displaced people (IDPs) are often the poorest in their countries, as many had to leave belongings and work behind. Internal displacement also implies additional cost for host communities and aid providers.	Internal displacement affects food security if food is no longer produced in regions of origin and resources are strained in areas of refuge.	IDPs physical and mental health is often affected by displacement. Health facilities may be strained in host areas; coverage and quality may diminish.	Displaced children may be out of school for months or years. Children in host communities may suffer from lower quality of education if classrooms are overfilled.	Women tend to suffer most from lack of infrastructure in temporary settlements. Displacement can also increase gender-based violence.

6 CLEAN WATER AND SANITATION	**7 AFFORDABLE AND CLEAN ENERGY**	**8 GOOD JOBS AND ECONOMIC GROWTH**	**9 INDUSTRY, INNOVATION AND INFRASTRUCTURE**	**10 REDUCED INEQUALITIES**
Camps often provide limited access to water sanitation and energy. Basic infrastructure in host communities may be overused and suffer shortages.		IDPs often leave their source of income behind and must work in their host area, pressuring the local labour market. Reduced productivity, consumption, exports and taxes harm the economy.	Resilient infrastructure and sustainable industries may help limit the scale of disaster-induced displacement.	IDPs should be able to enjoy the same rights and opportunities as their compatriots but often suffer from inequality and discrimination.
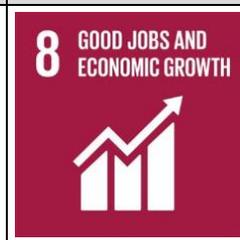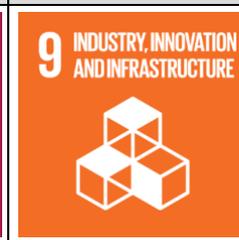
11 SUSTAINABLE CITIES AND COMMUNITIES	**12 13 14 15 LIFE ON LAND**		**16 PEACE, JUSTICE AND STRONG INSTITUTIONS**	**17 PARTNERSHIPS FOR THE GOALS**
Urban systems can be stretched by the sudden and unplanned arrival of IDPs in cities. Informal settlements, urban poverty and further displacement risk can increase. Many countries are facing challenges to cope with urban displacement.	Unsustainable use of natural resources, environmental degradation and climate change already push millions of people from their homes and will likely cause more displacement in the coming years.		Conflict and violence displaced 11.8 million people in 2017. Internal displacement can also facilitate the recruitment of IDPs by armed groups.	The scale and intensity of internal displacement can be reduced by dedicated policies, greater national accountability, increased participation and specific progress monitoring.

Figure 1: Internal displacement and its links with the 17 Sustainable Development Goals.

Source: IDMC, 2018

The 2030 Agenda also acknowledges that more frequent and intense disasters and related humanitarian crises can reverse development gains, with the potential future effects of global climate change posing even greater challenge (UNISDR, 2018). It also fully recognizes that displaced people and migrants are particularly vulnerable, and that specific actions, which are gender and age inclusive, need to be taken in order to empower them, and consequently reduce their vulnerabilities. Although only mentioned directly in Goals 8 (target 8.8), and Goal 10 (targets 10.7) migrants, refugees and displaced persons are components of the of the umbrella term "Vulnerable People", which is defined as:

"…People who are vulnerable must be empowered. Those whose needs are reflected in the Agenda include all children, youth, persons with disabilities […] people living with HIV/AIDS, older persons, indigenous peoples, *refugees and internally displaced persons and migrants* […]" (UN, 2015)[7].

Therefore, one may consider that several of the targets under the Sustainable Development Goals englobe migrant issues (e.g. the SDG 10, and target 10.7), while others cannot be achieved without the inclusion of migrants, such as SDG 16 (Figure 1). The 2030 Agenda reinforces migrants' role in achieving sustainable development, and the need to ensure safety of both migrants and displaced people (UNISDR, 2018). For instance, SDGs 1.5, 11.5 and 13.1 recognizes resilience building as a strategy to reduce the impact of disasters and climate change. This include indicators for the number of people directly affected by disasters, including those evacuated, displaced and relocated per 100,000 within a population. Therefore, policy makers when reporting the progress of such SDGs should primarily focus on identifying all forms and drivers of migration and displacement in order to "leave no one behind", providing a human rights approach and understanding of the particular realities and needs of those affected.

Ensuring the full implementation, monitoring, follow-up and review of the 2030 Agenda, therefore requires deep analysis of migration and displacement. For instance, achieving Goal 3 – "Ensure healthy lives and promote

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[7]Transforming our world: the 2030 Agenda for Sustainable Development. Available from:
https://sustainabledevelopment.un.org/post2015/transformingourworld

well-being for all at all ages", requires taking under consideration that migrants and mobile workers face particular risks of exposure to epidemics and communicable diseases, but are often left out of prevention and treatment programmes. Furthermore, implementing Goal 5 – "Achieve gender equality and empower all women and girls", requires acknowledging that violence against women and girls remains endemic in many societies; migrant women and girls are often subject to violence, harassment, sexual abuse and exploitation. Women and girls in certain situations are considered particularly at risk of being victimized by trafficking[8]. In Goal 8 – "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all", migrants can be unfairly compensated, exposed to hazardous work conditions, denied social protection, discriminated against, and denied access to decent jobs that promote sustainable livelihoods.

More specifically on the topic of migration and displacement risks and their links with climate change, Goal 13 – "Take urgent action to combat climate change and its impacts" (e.g. target 13.1), recognizes that climate change impacts are foreseen as a major driver of displacement of people, and internal climate migrants are rapidly becoming the human face of climate change (Rigaud, et al, 2018). Therefore, this goal and its targets must be deeply understood to be inclusive and sustainable for migrants, displaced people and refugees.

4.   Migration and displacement in the Sendai Framework for Disaster Risk Reduction

Over the years, disasters have continued to pose great challenges and, as a result, the well-being and safety of persons and communities have been affected. Therefore, it is urgent and critical to continuously anticipate, plan for and reduce disaster risk in order to more effectively protect persons, their livelihoods, health, socioeconomic assets and ecosystems, and thus strengthen their resilience (UNISDR, 2015).

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[8]The Sustainable Development Goals and Migrants/Migration. Available from:
http://www.un.org/en/development/desa/population/migration/events/coordination/14/documents/backgrounddocs/GMPA_14CM.pdf

In response, the Sendai Framework for Disaster Risk Reduction (hereafter Sendai Framework), was signed in 2015 following the expiration of the Hyogo Framework for Action. The Sendai Framework is a voluntary and non-binding agreement recognized by 190 member States, as a call for action for reducing the impacts of hazards on societies over the next decade (UNISDR, 2015). This framework acknowledges that migration and displacement are essential elements that need to be addressed in disaster risk management, which fundamentally aligns with the need of protecting people and their assets; and securing and promoting human rights (UNISDR, 2018). Among its seven Global Targets, target B, which aims to reduce the number of affected people globally by 2030 affected by disasters, is particularly relevant as it provides a basis for setting up objectives for DRR strategies that reduce the risk of disaster displacement and migration.

In comparison to its predecessor, the Hyogo Framework for Action, the Sendai Framework more frequently uses "migration" and "displacement" (and their related terms) in its text. Thus, the Sendai Framework has brought great visibility to the topic by prominently addressing the needs of displaced people and migrants; and by recognizing their roles as contributors to the implementation of the DRR agenda (IDMC, 2017b). Table 1 provides an overview of the Sendai Framework paragraphs in which migration, displacement and their related terms are referenced. In its text, the Hyogo Framework for Action, made just one reference to population movements in paragraph 19(i), while "evacuation" was also only mentioned once in paragraph 20(d). In contrast, the Sendai Framework covers a variety of mobility-related topics, including migration, displacement, relocations, evacuation, and in particular, places migrants as a relevant stakeholder when stating that they "contribute to the resilience of communities and societies, and their knowledge, skills and capacities can be useful in the design and implementation of disaster risk reduction" (Guadagno, 2016). The term "human mobility" is also used to refer to forced or involuntary (displacement), voluntary (migration) and forced or voluntary (planned relocation) (UNISDR, 2018). While solely descriptive, in the Sendai Framework, the term "people displaced by disasters" is used to refer to persons who have to leave their place of residence due to risk of disaster. In contrary, "migrants" and "migration" are now positively perceived as an adaptation strategy adopted by people that have to cope with changes in the external environment, and as opportunity to risk reduction (Sudmeier-Rieux, et al, 2017). This is particularly relevant in the context of slow-onset hazards such as agricultural drought and the gradual dynamics of environmental change.

Table 1: References to migration and displacement in the Sendai Framework using their related terms

Human Mobility	Migration	Displacement	Relocation	Evacuation	Affected People
Paragraph 30(l)	Paragraph 7	Paragraph 4	Paragraph 27(k)	Paragraph 33(h)	Paragraph 18(b)
	Paragraph 27(h)	Paragraph 28(d)		Paragraph 33(m)	Paragraph 19(d)
	Paragraph 36(a)(vi)	Paragraph 33(h)			Paragraph 30(j)
		Paragraph 33(j)			Paragraph 30(l)
					Paragraph 33(i)

The Sendai Framework also highlights the importance of governments and public policies in facilitating and coordinating preventive and adaptive human mobility. For instance, paragraph 7, it states that governments, engaged with relevant stakeholders, have the primary role in designing and implementing DRR policies. In paragraph 27(k), it addresses the need for public policies to enable the relocation of human settlements located in disaster risk-prone zones (UNISDR, 2015); and for programmes that strengthens the resilience of people affected by disasters and their host communities. Another important aspect is the role of accounting for migration and displacement in land use policy and urban planning. Given that the movement of people primarily causes demographic changes, especially in cities such mass movement, can contribute with urban sprawl and socio economic heterogeneity (Guadagno, 2016; Lee & Guadagno, 2017). Therefore, territorial and land-use planning can be seen as priority activities in identifying risk-prone areas and structures that currently are, or in future may become, unsafe for human settlement (UNISDR, 2018). Lastly, the Sendai Framework also recognizes the role of

public policies in finding durable solutions, ensuring financial and human resources, and coordinating preparedness and developing contingency planning for those affected by disasters.

4.1 Migration and displacement: examining other post-2015 global policies and processes

The Sendai Framework acknowledges that in order to achieve substantial reduction of disaster risk more emphasis shall be placed in drawing coherence between DRR and other global efforts to mitigate the impacts of climate change through the Paris Agreement of the UN Framework Convention on Climate Change (UNFCCC) (4.1.1); with the call to address and reduce humanitarian need, risk and vulnerability through the Agenda for Humanity (4.1.2); with the set of action needed to protect the human rights of refugees and migrants through the recently adopted Global Compact for Safe, Orderly and Regular Migration (4.1.3); and other frameworks such as the New Urban Agenda (4.1.4). Therefore, in this section we highlight some global frameworks that contribute to relevant international policy and processes in the area of human mobility, which also address issues of climate change, disasters and conflicts.

4.1.1 The Paris Agreement

Entered into force in 2016, the Paris Agreement has as its long-term goal to enhance the implementation of climate actions that enables the world to keep the increase of its global average temperature to well below 2 °C above pre-industrial levels (UNFCCC, 2015). Climate change is expected to adversely affect human mobility in several manners, and as described by the Executive Committee of the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts, these impacts could be expected in four different ways[9]:

(1) Increased frequency and intensity of extreme weather events displaces people on a temporary and permanent basis;

(2) Global warming and drought affects the production of agricultural goods and access to clean water needed to sustain livelihoods. These events lead individuals to search for alternative locations that offer livelihood and food security;

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[9]Executive Committee of the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts.[Accessed 19 February 2018]. Available from:
https://unfccc.int/files/adaptation/groups_committees/loss_and_damage_executive_committee/application/pdf/excom_iom_technical_meeting_pillar_1.pdf

(3) Slower-onset climate impacts such as sea level rise and desertification may decrease the habitability of certain locations including low-lying coastal areas (e.g. deltas and small islands) and arid zones. Consequently, these changes could contribute to permanent human displacement;

(4) Climate change impacts may intensify distresses on community cohesion (e.g. amplified poverty) and reduce its ability to diffuse tensions that may results in violent conflict and persecution-related human mobility, especially in fragile states.

Therefore, during the 21st Conference of Parties, a Task Force on displacement was created to "develop recommendations for integrated approaches to avert, minimize and address displacement related to the adverse impacts of climate change" (UNFCCC, 2015). Recently, during the 22nd Conference of the Parties in 2016, migration was accepted as a potential adaptation strategy of climate change (Yamamoto, Serraglio and Cavedon-Capdeville, 2018), which constitutes an important step in enabling human rights and security of individuals.

4.1.2   Agenda for Humanity

The World Humanitarian Summit (May 2016) was a pivotal moment for the global community to generate momentum to move forward with a political agenda that outlined the changes needed to alleviate suffering, reduce risk and lessen vulnerability on a global scale, the so-called "Agenda for Humanity"[10]. During this Summit, 180 Member States of the United Nations, over 700 local and international NGOs, the private sector and other stakeholders demonstrated support for the Agenda, which is facilitated by United Nations Office for the Coordination of Humanitarian Affairs (OCHA).

The Agenda for Humanity comprises five major areas (core responsibility) and 24 key transformations for action that must be addressed in order to reduce humanitarian need, risk and vulnerability on a global scale[10] In summary, core responsibility 1 recognizes that ending human suffering requires political solutions and sustained leadership, while core responsibility 2 addresses the minimization of human suffering and protection of civilians through strengthened compliance with international law. Core responsibility 3 and 4 address the issues of vulnerability in fragile contexts (including conflicts and disaster), and the shift from delivering aid to ending need. Lastly, Core responsibility 5 comprises of a call for shared responsibilities for humanity, which requires political,

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[10]Agenda for humanity. Available from: https://www.agendaforhumanity.org/

institutional and financing investment. In Figure 2 , we illustrate the five core responsibilities, and their 24 key transformations.

POLITICAL LEADERSHIP TO PREVENT AND END CONFLICTS	UPHOLD THE NORMS THAT SAFEGUARD HUMANITY	LEAVE NO ONE BEHIND	CHANGE PEOPLE'S LIVES: FROM DELIVERING AID TO ENDING NEED	INVEST IN HUMANITY
1. Leadership to prevent and end conflict 2. Act early 3. Stay and invest 4. Be inclusive in decision making	5. Protect civilians and civilian property 6. Ensure delivery of humanitarian and medical assistance 7. Speak out on violations 8. Improve compliance and accountability 9. Stand up for the rules of war	10. Address displacement 11. Address migration 12. End statelessness 13. Empower and protect women and girls 14. Ensure education for all in crisis 15. Empower young people 16. Include the most vulnerable	17. Reinforce local systems 18. Anticipate crises 19. Transcend humanitarian-development divides	20. Invest in local capacities 21. Invest according to risk 22. Invest in stability 23. Shift from funding to financing 24. Diversify resources and increase efficiency

Figure 2. Five core responsibilities and 24 key transformations that will help addressing the Agenda for Humanity. Source: https://www.agendaforhumanity.org/

In the commitment 3, leave no one behind, Member States specifically address the issue of migration and displacement. Through that, they committed to integrating the vulnerabilities of migrants into humanitarian and other response plans. Furthermore, States also agreed to reduce internal displacement, and to prevent and prepare for cross-border displacement associated with disasters and climate change (UNISDR, 2018). Furthermore, in commitment 5 -invest in humanity- there is a strong emphasis on the need to increase investments in crisis prevention, and on strengthening community resilience. Member States supported the call for investments that seek long-term and risk-informed sustainable development as also an avenue to implement

the Sendai Framework; and to increase support to countries vulnerable to disaster risks or the negative consequences of climate change[10].

4.1.3   Global compact for safe, orderly and regular migration (GCM)

The GCM, recently adopted in 2018, is a milestone in the history of the global migration dialogue. It is guided by the 2030 Agenda for Sustainable Development and the Addis Ababa Action Agenda, and informed by the Declaration of the High-level Dialogue on International Migration and Development adopted in October 2013. It is a commitment that aims to mitigate the adverse drivers and structural factors that hinder people from building and maintaining sustainable livelihoods in their countries of origin, and so compelling them to seek a future elsewhere. The GCM intends to reduce the risks and vulnerabilities migrants face at different stages of migration by respecting, protecting and fulfilling their human rights and providing them with care and assistance. It also seeks to address legitimate concerns of communities about migration and the demographic, economic, social and environmental changes their societies are undergoing. Furthermore, the Global Compact for Migration strives to create conducive conditions that enable all migrants to enrich our societies through their human, economic and social capacities, and thus facilitate their contributions to sustainable development at the global level[11]. The GCM acknowledges that both disasters and climate change are drivers of migration, and that efforts are needed to integrate migration in DRR strategies, and to promote migration as an adaptation strategy (UNISDR, 2018).

4.1.4   Other Frameworks

Given the multidimensional risks – social, economic, environment, and political – influencing the movement of people, other intergovernmental and sustainable development frameworks address issues that may be seen as drivers of migration and displacement. For instance, the New Urban Agenda (NUA) addresses migration through the context of urbanization. As outlined in Resolution 66/207 and in line with the bi-decennial cycle (1976, 1996 and 2016), the United Nations General Assembly convened the 3rd United Nations Conference on Housing and Sustainable Urban Development (Habitat III) in October 2016 in Quito, Ecuador to assess emerging trends and renew commitments to sustainable urban development through the implementation, monitoring,

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[11]Global Compact for migration. Available from: https://refugeesmigrants.un.org/migration-compact

follow-up and review of the New Urban Agenda. The NUA builds upon the Habitat Agenda of Istanbul in 1996, providing a framework through 2036. Reference to migration and displacement are seen throughout the document, with emphasis on highlighting the territorial of the 2030 Agenda for Sustainable Development. It also seeks an integrated approach to the implementations of SDG 11 of making cities and human settlements inclusive, safe, resilient and sustainable. It specifically highlights the fragile situations migrants and refugees face in relation to discrimination (para 20), urban-to-rural linkages (para 28), contributions from various stakeholders (para 42), and data disaggregation (para 104, and 107)[12].

Furthermore, another relevant framework is the Addis Ababa Action Agenda (4A), which harnessing migration for financing and sustainable. The 4A was adopted in July 2015 at the 3rd Financing for Development Conference, building upon the 2002 Monterrey Consensus and the 2008 Doha Declaration. This agenda aims to strengthen the framework to finance sustainable development as means of implementation of the 2030 Agenda. Paragraph 11 recognizes the complexity of international migration and the implications for the development of areas where migrants originate from, transit to, as well as in their final destinations . It further focuses on the importance of social integration and the protection of human rights, while promoting multilateral cooperation to ensure skills and access to recourse to promote decent jobs and livelihoods. Given that substantial wages earned by migrants are sent to their families in their countries of origin, countries agreed to work towards lowering the average transaction cost of migrant remittances by 2030 to less than 3 per cent of the amount transferred.

In addition to these two agendas, several other conventions that address migration issues can be highlighted. Examples include, among others, the International Labour Organization, which has adopted a series of conventions aimed at promoting decent jobs and livelihoods; and the UN Convention to Combat Desertification and IOM that was agreed in 2015 to look more closely at the land-migration nexus to better understand the way in which climate changes leads to land degradation and migration. In Table2, we summarize other member state-led international policies and processes that address key topics of disaster displacement and human mobility and may be of relevance, but were not covered in this article:

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[12]Habitat3.org. (2018). [Accessed 13 Aug. 2018]. Available from: http://habitat3.org/wp-content/uploads/NUA-English.pdf

Table 2: Other global processes and policies that address the issue of human mobility and their respective references.

Other international policies and processes	Reference
Migrants in Countries in Crisis Initiative (MICIC)	www.micicinitiative.iom.int
Platform on Disaster Displacement (PDD)	www.disasterdisplacement.org
Regional consultative processes on migration (RCPs)	www.iom.int/regional-consultative-processes-migration
UN Human Rights Council (UNHRC)	A/HRC/35/L.32
Small Island Developing States (SIDS) Accelerated Modalities of Action (SAMOA) Pathway	A/RES/69/15

5. Tools and data to better understand risks leading to human mobility

Data-driven tools improve our understanding of crises. Traditionally, these tools have helped practitioners to answer urgent questions surrounding an emergency such as who is displaced and why. Describing a disaster undoubtedly enhances our ability to respond to it. But merely responding to crises is no longer enough. There is growing demand[13] for more preventative actions to stop turbulent events from escalating into full-fledged disasters. In 2016, UN Secretary-General Ban Ki-moon put forth a call for better early warning tools, announcing, "We are placing a growing focus on prevention through both early warning and early action. We should all much prefer to assess early information than to wait for the warning signs of disaster"[14]. Organizations

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[13]Lazicky, Christy. "Improving Conflict Early Warning Systems for United Nations Peacekeeping." Second Year Policy Analysis, Harvard University, 2017. Available from: https://bit.ly/2MsgmBE
[14]Secretary-General Says Early Warning, Action to Prevent Conflict Remains Best Approach to Advance Vision of Peace as Security Council Debates UN Charter | Meetings Coverage and Press Releases." [Accessed August 8, 2018]. Available from: https://www.un.org/press/en/2016/sgsm17540.doc.htm.

such as Internal Displacement Monitoring Centre (IDMC)[15] and the Water, Peace and Security Partnership (WPS)[16] are working to meet this demand using artificial intelligence. These programs exemplify the direction of conflict and displacement monitoring technologies. With increased demand for predictions, advancements in data collection methods, and access to superior computational power for modelling, early warning systems (EWS) represent one of the most promising trends in human security tools.

5.1   Early Warning Systems

The practice of forecasting risk is not new. EWS have a long history that covers a vast range of disciplines from natural hazards to nuclear attacks. The interest in predictive information on conflict and displacement has existed for many years[17], but the appetite for making decisions based on predictions is growing (De Perez, et al, 2016). Predictive information offers many benefits, including: Proactive, evidence-based information to aid decision making;

●   Improved programming through systematic regional reviews;

●   Better priority-setting criteria;

●   A shared starting point for organizations to address regions of concern, which facilitates joint response strategies and more coherent responses (OECD, 2009).

In short, forecasting tools are championed in the belief that being proactive is more effective and less expensive than being reactive[18]. For example, FAO's *Early Warning Early Action* tool found that for every $1 FAO spent on early livestock interventions in the Horn of Africa, a family saw $9 in benefits from the avoided loss of livestock production[19]. However, it is important to note that EWS only does not ensure the prevention of disaster: early warning messages must be met with timely, targeted responses to be effective. For example, preceding the devastating drought in Somalia in 2011, two EWS's—the Food Security & Nutrition Analysis Unit and the Famine

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[15]IDMC, 2018. What drives internal displacement? A machine learning approach. Expert Opinion. Available from: http://www.internal-displacement.org/expert-opinion/what-drives-internal-displacement-a-machine-learning-approach.
[16] WPS, 2018. RELEASE: New Initiative Calls for Urgent Action on Water and Security | World Resources Institute. Available from: http://www.wri.org/news/2018/03/release-new-initiative-calls-urgent-action-water-and-security (accessed 8.8.18).
[17] Auclair, A. N.D. 1999. Population Displacement and Migration in Developing Countries: An Exploratory Study in the Development of an Early Warning Decision Support System. RAND Science and Technology National Defense Research Institute. Available from: https://www.rand.org/content/dam/rand/pubs/monograph_reports/2007/MR1264.0.pdf
[18]Collin, Katy. "The Year in Failed Conflict Prevention." Brookings (blog), December 14, 2017. Available from: https://www.brookings.edu/blog/order-from-chaos/2017/12/14/the-year-in-failed-conflict-prevention/.
[19]FAO - News Article: Acting Early to Prevent Humanitarian Emergencies. [Accessed August 8, 2018]. Available from: http://www.fao.org/news/story/en/item/1145645/icode/.

Early Warning Systems Network—provided 11 months of timely, accurate, and actionable famine warning, but decision makers failed to respond in part due to their apprehension of EWS (Hillbruner & Moloney, 2012). As a result, the drought escalated into famine. Neighboring Kenya and Ethiopia were reportedly taking in over 2,000 Somalian refugees a day.

5.2 Data Innovations

Early warning systems have greatly benefited from the data revolution. Data providers are contributing to the revolution by releasing data in machine-readable formats that are openly accessible and curated more frequently and at finer resolutions than ever before. For example, satellite imagery enables us to track precipitation in real-time and forecast crop yield down to the kilometer[20]; local media coverage in most languages can be scraped and curated into global catalogs of conflict[21]; new algorithms can identify the sentiment of a tweet (Martínez-Cámara, et al, 2014). While these advancements in data improve the predictive accuracy and timeliness of EWS, problems with data coverage and availability still exist. Catalogues of conflict such as the ACLED and GDELT have filled an important gap in our understanding of conflict yet are limited by their geographical and temporal scope[22] or their lack of validation (Wang, et al, 2016). Socio-economic censuses are vital to recognize the vulnerabilities of exposed populations yet are commonly only available at the national scale (Bahaug & Lujala, 2005). What's more, countries enduring ongoing crises (thus requiring a great deal of attention) typically suffer the most from missing data, as the disaster itself limits collection efforts (Cohen and Arieli, 2011; Himelein et al, 2016).

5.3 Modelling innovation: prediction using machine learning

In the past, conflict prediction has relied heavily on expert opinions and statistical models. While these techniques are useful for explanatory analyses, they often fail as prediction tools. A study of 300 professionals' predictive power in forecasting geopolitical events found that their expert opinion was no more successful than random guesses[23]. Many statistical methods have placed high importance on quantifying the significance of each indicator, rather than the predictive capabilities of these models (Chadefaux, 2017), and present poor out-of-

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[20]Brokaw, Alex. "This Startup Uses Machine Learning and Satellite Imagery to Predict Crop Yields." The Verge, August 4, 2016. Available from: https://www.theverge.com/2016/8/4/12369494/descartes-artificial-intelligence-crop-predictions-usda.
[21]ACLED Data." Acled Data. [Accessed August 8, 2018]. Available from: https://www.acleddata.com/
[22]ACLED data is limited to Africa, South Asia, South East Asia and the Middle East. "ACLED Data."
[23]Expert Political Judgment. Princeton University Press. [Accessed August 8, 2018]. Available from: https://press.princeton.edu/titles/11152.html.

sample forecasts (Ward, Greenhill and Bakke, 2010). Some statistical models are focused on predictions, but research shows that machine learning models, in general, consistently can outperform standard statistical approaches (Mullainathan and Spiess, 2017).

Machine learning has the potential to revolutionize the field of early warning systems by making complex, data-intensive problems amenable to rigorous, predictive analysis. The adoption of machine learning is now feasible thanks to methodological advancements and ever-wider access to scalable, cloud-based computing power. There is no one-size-fits-all machine-learning technique; users must choose the algorithm that best suits their purpose. Speaking broadly, supervised machine learning algorithms maximize predictive accuracy in complex problems while unsupervised learning methods find patterns in noisy data. Because EWS boil down to prediction, a supervised classification approach such as random forest is a promising technique. Random forest algorithms can accommodate dissimilar numeric datasets varying in size and range with minimal preprocessing. For instance, WPS is leveraging the random forest algorithm to process real-time biophysical data with less frequently published socioeconomic data[16]. The end goal is to create a global hotspot map that highlights areas of concern regarding future conflict and migration. Though this type of algorithm is frequently effective at predictive tasks, it generally cannot answer questions of causation. Indeed, a constraint of most machine learning techniques, such as those used in WPS's tool, is that they provide no explanation of or insights into the predictive power of a given model.

6.   Discussion and Conclusions

According to the World Bank report "Groundswell - Preparing for Internal Climate Migration", without urgent global and national climate action, Sub-Saharan Africa, South Asia and Latin America could see more than 140 million people move within their countries' borders by 2050 (Rigaud et al., 2018). In response, decision-makers are attempting to understand interlinkages between drivers of migration and displacement, in order to design preventative and responsive actions that reduces people's vulnerability. As a consequence, there is a strong call to improve evidences to enhance our ability to anticipate risks and respond to early warning indications of migration and displacement. Reliable data, and data-driven tools and methods are increasingly becoming important elements for mainstreaming migration and displacement into evidence-based actions for a resilient future.

However, while a lot of effort is being spent on trying to quantify the precise relationship between hazard and mobility, this task is not often easily tracked. Attributing and monitoring population movements directly to climate change and disasters are extremely difficult: people move for a wide variety of reasons, and even where hazards contribute to this decision, underlying socioeconomic, cultural, political and environmental processes either enable or constrain people's ability to cope where they are, or force them to move (Opitz-Stapleton, et al, 2017). This picture is even more complicated in contexts affected by conflict and fragility.

Despite a decade of research, debate and politicking, evidence and discourse remain fragmented, and there is arguably too little in the way of positive policy advice. It has been posited that environmental change will bring challenges, especially to those most vulnerable in society – including those too poor to move, but that it also offers opportunities (Black, et al, 2011b). One such opportunity is to confront changing socio-environmental conditions through the lens of adaptive capacity. Adaptive capacity can be defined as: "the ability to take advantage of a disturbance and to "build or bounce back better (Manyena, et al, 2011), as well as learning from the legacy of recurring shocks and stresses. This ability to recover in such a way as to reduce vulnerability to future events is vital to the notion of adaptive capacity. Without it, communities often get stuck in risk traps and recurring cycles of vulnerability (Becchetti and Castriota, 2011; Bahadur, et al, 2015).

While many climate change interventions seek to build adaptive capacity – including by the Department for International Development (DFID) funded BRACED programme[24], it remains to be seen how and in what ways the international policy architecture established to deal with climate change and DRR – the Paris Agreement (UNFCCC, 2015) and Sendai Framework for Disaster Risk Reduction (UNISDR, 2015)– will integrate issues of conflict and fragility.

Arguably, there is a need to de-securitise migration and displacement and reframe the debate in terms of supported human mobility. In practice this means that first, risk-informed development strategies and policies have the potential to reduce vulnerability and enhance abilities to cope with, respond to and acquire the necessary skills to deal with shocks and stressors (Opitz-Stapleton, et al, 2017). Such plans must operate in both origin and destination communities – and may require greater consideration of the transboundary nature of

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[24]Foundation, T. (2018). BRACED. [online] Braced.org. [Accessed 13 Aug. 2018]. Available from:: http://www.braced.org/

change; acknowledge the heterogeneous nature of those moving - with consideration of intersectionality; and account for permanent, temporary and circular migration (ibid.).

Second, as many countries see migration as an adaptation strategy, migration arguably has to be supported much more strongly in National Adaptation Plans under the UN Framework Convention on Climate Change[25]. In moving to safety, affected populations should, to the extent possible, be able to migrate in an orderly manner, using safe and legal routes. Without access to such routes, people may have to embark on hazardous journeys that involve smugglers and traffickers, which put those fleeing at risk of exploitation and abuse. As Optiz-Stapleton, et al, (2017) have argued, increasing the number and reach of legal routes should be adopted as part of the Global Compact for Migration.

Third, efforts must continue to strengthen the protection available to people affected by disaster displacement, whether they remain within or leave their own country, building on existing protection frameworks and pursued in the context of a reinvigorated discourse on the human rights of internally displaced people. It remains the case that, the way in which climate change and disasters, migration and displacement and its links to conflict and security are framed, should be treated with some caution. Broadly speaking, there is: no consensus on the relationship, the evidence varies in quality; terms are often used interchangeably; and focus tends to be on postulating the number of so-called "climate migrants" rather than understanding the underlying complex dynamics that influence when, how and why some individuals mobilize, patterns of movement, and relations with transient and receiving communities (ibid.).

Moreover, while it has widely been accepted that "disasters are the manifestations of unresolved development problems" [8]– at least in the DRR community and academic circles, the connections have not been widely made between disaster impacts, population movement and poor socioeconomic development. Displacement, and migration, whether temporary, cyclical or permanent, are influenced by a range of factors which include disasters - the product of "deficiencies in development" (ODI, 2018).

More research and better data is required, and consensus reached in relation to the descriptive labels applied to people who are obliged to move as a result of both slow- and sudden-onset disasters; and language

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[25]UNFCCC .2018. Overview - National Adaptation Plans webpage. [Online]. [Accessed 9th August 2018]. Available from: https://unfccc.int/topics/resilience/workstreams/national-adaptation-plans/overview

needs to be more closely aligned across sectors and frameworks. More nuanced and deeper understanding is needed of the relationship between climate change, environmental change and population movement particularly in relation to other types of social change (Black, et al, 2011b).

"Securitisation" of climate change and migration isn't just academic exercise. Words matter, and the way an issue is framed can have real impacts on the way data is assessed, policies are constructed and enforced, the government departments responsible for an issue and financial resources allocated (Peters, forthcoming), and ultimately the way human mobility is experienced by those on the move.

As migration and displacement have become increasingly relevant and a global challenge, such issue can no longer be neglected when discussing sustainable development. When analyzing the impacts of migration and displacement among different international policies and processes, a broader dimension should be considered rather than just an economical perspective. These include dimensions of health, politics, education, gender equality, infrastructure, the building of inclusive societies and the response to climate change. At the same time, the large volume of international migration calls for mechanisms to ensure that migrants' rights are protected and that they are not subject to discrimination and abuse (UN, 2017). Therefore, significant opportunities exist to avert and minimize displacement and migration related to climate change, conflicts and disasters. Investments in actions that reduce disaster risk and the adverse impact of anthropogenic and climate factors, while promoting durable and human centric solutions and policies will help maintaining the wellbeing, dignity and livelihoods of migrants and displaced persons now and in the future.

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