Written evidence submitted by Mr Roland D. Smith, Professor Robert J. Nicholls, and Dr Avidan Kent

Understanding the challenge: Impact of climate change on displacement and population flows

Evidence to Environmental Audit Committee

Roland D. Smith *(1,2), Robert J. Nicholls (1,2), Avidan Kent (1,3)

(1) Tyndall Centre for Climate Change Research, University of East Anglia (UEA);
(2) School of Environmental Sciences, University of East Anglia (UEA);
(3) School of Law, University of East Anglia (UEA)

1. Purpose and authors

1.1. This evidence addresses the question of the relationship between climate change and population growth, specifically the effect of this relationship on displacement and population flows, both within the UK and across borders.

1.2. As such, it provides a top-line summary of current academic research and consensus regarding the impact that climate change will have on existing flows of population mobility. This draws on a wide range of academic literature including the results of studies modelling of future population flows under differing climate change scenarios.

1.3. The authors of this submission are members of the Tyndall Centre for Climate Change Research and include its director, Professor Robert Nicholls. The Tyndall Centre was founded in 2000 to conduct cutting edge, interdisciplinary research to develop sustainable responses to climate change and whilst providing a conduit between scientists and policymakers. With over 200 members across scientific, engineering, social science and economic communities, the Tyndall Centre represents a substantial body of the UK's climate change expertise.

2. Recommendations for Government

2.1. Climate mobility is a highly diverse global phenomenon. Its impact on flows of population mobility is likely to be significant, but the degree of this impact will be

dependent on local circumstance and will be contingent on individual states' ability to cope and adapt to increased severity and frequency of environmental shocks and degradation. Policy responses must therefore be tailored-made and the government should be wary of one-size fits all solutions and policies vis-à-vis climate mobility.

2.2. Migration is and will continue to be an effective adaption strategy for populations most exposed and vulnerable to the impacts of climate change. As part of the UK's foreign/aid policy, the government should pay special attention to the protection of displaced persons' human rights and the resources that are needed so such protection is effective.

2.3. The government should fund research of specific locations to better understand their unique needs, using this as a foundation for the design of tailor-made aid/foreign policies. In doing so, the government should recognize that investment will need to be made in places of destination to ensure migrant communities are not facing increased uncertainty and vulnerability as well as to prevent wider social instability.

3. Summary

3.1. The most recent Intergovernmental Panel on Climate Change Sixth Assessment Report (IPCC AR6) observes that global population flows have begun to shift as a result of climate change and that this influence is likely to increase as the impacts of climate change become more severe and widespread[1,2].

3.2. Climate change is expected to increase the frequency, intensity and severity of climatic and environmental 'rapid onset' events and disasters, including droughts, storms and floods[3–6]. Such 'rapid-onset' events have significant potential to cause catastrophic damage to housing and livelihoods triggering displacement of affected communities, whether through temporary evacuation or permanent relocation [7,8].

3.3. The frequency of such events will also contribute to displacement as populations face multiple successive or cumulative impacts, which mean that the 'threshold to recovery' becomes too high and households are forced to pursue migration in an attempt to cope with the loss of property and livelihoods[9].

3.4. At the same time, climate change will also be experienced through gradual 'slow onset' environmental change and degradation. This will include increased water stress, greater variability of weather conditions and rising sea-levels, leading to salinisation of coastal lands, erosion, and increased impacts of storm surge. In turn, these conditions will result in reduced agricultural yields, loss of biodiversity and changing productivity of livelihood activities motivating more people to pursue migration in search of new occupations.

3.5. In extreme cases - such as inundation of Pacific Small Island Developing States (SIDS) due to sea-level rise, or areas of sub-Saharan rendered uninhabitable by extreme heat - these environmental and climatic changes pose an existential risk to communities.

3.6. Given the large numbers of people potentially at risk, these impacts could mean a radical reshaping of existing patterns of population. The Groundswell report (2018) produced by the World Bank, for example, suggests that across Sub-Saharan Africa, South Asia, and Latin America, 143million will be forced to migrate within their countries by 2050[10].

3.7. Consequently, the impact on the security of the United Kingdom (UK) could conceivably result from:

- Increased international migration from nations and regions affected by impacts associated with climate change; and,

- Instability and conflict in other nations resulting from destabilization associated with increased climate mobility.

3.8. For populations who are most exposed and vulnerable to the impacts of climate change migration mobility will be a crucial adaptive response. These 'climate migrants' will tend to follow existing migration pathways that have been established by earlier waves of migration and displacement. Therefore, the majority of any

increased migration associated with climate change is likely to be 'internal' - within national borders.

3.9. Given the high cost and obstacles associated with international migration, the proportion of those displaced by climate change who will migrate cross-border are likely to be low. Where this occurs, it is likely to be to nearby urban centres, across porous borders - for example those displaced by drought in southern Ethiopia drawn to Nairobi, Kenya.

3.10. There are, however, exceptional and high-profile examples of where impacts of climate change may lead to significant flows of international climate migrants, particularly in Pacific islands facing existential risk from sea-level rise. This example is notable as it has led to exploration of legal frameworks Australia and New Zealand to facilitate migrant pathways with island nations, including the ratification of the Australia-Tuvalu Falepili Union treaty, the world's first bilateral agreement on climate mobility[11].

3.11. There are specific communities within the UK that are at risk of displacement by impacts of coastal change which climate change is exacerbating - particularly as a result of inundation resulting from coastal floods or accelerated coastal erosion. These are, however, limited in terms of geographical scope and numbers of people affected over the next few decades. Consequently, the resulting impact on internal population flows and national security of internal UK climate-migration should be considered low risk.

3.12. Although the impact of climate change on population flows and patterns of migration is unlikely to be experienced at UK borders in the short to mid-term, it is a phenomenon that will increasingly add to the pressures on, and instability of, vulnerable and exposed regions over the coming decades. It is expected to be a significant development issue and has the potential to affect global security.

4. Population flows, migration, and displacement

4.1. The general term ‘population flows’ encompasses a range of forms of human mobility including those characterised as ‘displacement’ and ‘migration’.

4.2. Displaced populations are defined in the Guiding Principles on Internal Displacement (1998), those who are "*forced or obliged to flee or to leave their homes or places of habitual residence*” [12(p1)]. As outlined by the Internal Displacement Monitoring Centre, people can be displaced during a ‘rapid-onset’ event or when the ensuing disaster places them in physical danger, as well as during a pre-emptive evacuation. Displacement from rapid-onset events tends to be short term and relatively local, predominantly within international borders [13].

4.3. Migration denotes a permanent or semi-permanent movement of place of residence of an individual. Migration is often characterized by a degree of agency on the part of the migrant, who makes a conscious, proactive and anticipatory decision to relocate in pursuit of perceived benefits or aspirations[14].

4.4. Population mobility can take place over different timescales - permanent, temporary or seasonal - and it can represent a relocation of an entire household or ‘fragmentary’ migration, where households deploy a proportion of their labour - a member of the household with a high earning potential - to other labour markets[15].

4.5. As such, migration has been increasingly understood as a potential positive adaptation strategy by populations in response to a changing climate[16].

5. Exposure, sensitivity, and vulnerability to climate change

5.1. Despite the widespread consensus that climate change will have a significant impact on patterns of population mobility, there is still uncertainty as to the quality, magnitude, and direction of this influence.

5.2. Environmental change and shocks associated with climate change rarely affect population flows directly. Rather, they are mediated by pre-existing economic, social,

and political factors [17]. These in turn are accentuated by the specific livelihoods and circumstances of affected populations[3].

5.3. Such factors, in combination with the state's policies and its capacity to support affected communities, will determine an individual's or household's capacity to prepare for, adapt to and recover from the environmental shocks associated with climate change.

5.4. Similarly, where there are pre-existing political tensions and social instability, climate change and other factors related to the weather and environment can act as 'threat multipliers', increasing the likelihood of displacement [18].

5.5. The vulnerability of a population to climate change is therefore a function related to the 'exposure' – in terms of proximity, severity and frequency – to an environmental shock, and their 'sensitivity' to the same shock, determined in part by both their and their states' capacity to adapt to or cope with the impacts of that shock[7].

5.6. Consequently, although millions of people currently live below mean high tide in densely populated delta cities such as Tokyo and Shanghai, they can do so in relative safety as coastal adaptation measures reduce their vulnerability to environmental shocks and stressors[19], whereas delta regions such as Bangladesh located in the Global South, the vulnerability of coastal communities is by socio-economic factors and institutional deficiencies[20].

5.7. In Bangladesh, however, the building of cyclone shelters and implementation of early warning systems has radically improved communities' resilience to cyclone impact. This has improved local people's ability to remain in exposed coastal regions in the face of rising sea-levels.

5.8. Thus, although climate change is a global phenomenon, its impacts will be felt disproportionally in the developing world where economic, political, and social conditions contribute to the vulnerability of populations. At the same time, there are

measures that can be implemented to support the resilience of local people and reduce subsequent displacement and migration.

6. Climate change as a driver of human mobility

6.1. The influence of climate change and variability on migration is a complex, multi-causal phenomenon. Environmental and climatic impacts are moderated by the interwoven pre-existing political, economic, demographic, social and environmental drivers of mobility. These themselves are muted or amplified by the specific livelihoods and circumstances of the affected populations[21].

6.2. Impacts associated with climate change are often location specific. For example, in East Africa both flash-flooding and extended drought are associated with increased population flows, whereas in Asian delta regions increasing salinization of agricultural land triggered by storm surge and drought-induced reduced river flow has been shown to trigger migration to cities[22].

6.3. People are anchored to their place of origin through their homes, land, livelihoods, and family responsibilities, as well as their cultural ties and social connections. When faced with environmental or climatic threats most people will attempt to adapt in place. This has been shown even where populations resident on islands that are facing severe, sustained flooding prefer to remain in place rather than submit to government relocation and risk loss of their communities and livelihoods [23].

6.4. Where displacement is triggered by extreme or sudden onset events, an initial phase of 'evacuation' is often followed by a return of people to their homes where they will attempt to recover and rebuild[6]. Where the 'threshold of recovery' is too high – for example, individuals lack the resources to repair homes and property, or livelihoods have been destroyed – this initial return can be followed by a secondary phase of population movements which themselves can be temporary or permanent, localised or over longer distances[6].

6.5. The potential of climate change to trigger displacement occurs where the severity of associated environmental degradation is such that local populations are unable to adapt to the changes. For example, at the start of April 2024, an extreme heatwave across the Sahel and West Africa saw maximum temperatures reach 45ºC [24]. Extended periods of extreme heat, such as this, couple with sustained increases in temperature are likely to render increasing areas of sub-Saharan Africa uninhabitable, resulting in resident populations being displaced. Similarly, Pacific SIDS, especially those based on low-lying atolls, face an existential threat from rising sea-levels.

6.6. Climate change will also contribute to increased frequency and intensity of extreme 'rapid onset' events. Subsequent shocks will amplify the impact of those that have occurred previously, particularly when households have already exhausted their assets.

6.7. There will be a critical threshold where populations become overwhelmed by multiple and sequential shocks that will result increased displacement of populations who would otherwise been able to adapt in place[25]. In Bangladesh, cyclone Aila (2009) - which followed 18 months after cyclone Sidr (2007) - initially displaced around 2 million people[26]. Khulna city, divisional capital of the worst affected region, saw an influx of 15,000 displacees, many of established communities in the slum areas on the edge of the city[26].

7. Pre-existing population flows and migration pathways

7.1. Mobility is already an established strategy for pursuing economic opportunities, as well as for coping with socio-economic and environmental shocks and degradation[9]. As such, for many populations and countries that are most vulnerable to climate change, migration is already intrinsic to many people's way of life.

7.2. Patterns of migration tend to be dominated by a flow from rural to urban centres, reflecting the general trend towards mobility as nations experience increasing levels of development[27]. This is driven primarily by the pull of future economic and educational opportunities.

7.3. These population flows help establish ‘migration pathways’ that can facilitate subsequent migration. A key part of this process is the establishment of migrant communities’ place of destination. This ‘beachhead effect’ acts to reduce the financial and social costs for future migrants[28]. Consequently, those people with existing ‘migration networks’ are themselves more likely to migrate[29].

7.4. Population flows are also affected by the availability of legal migration pathways. Roughly half of the residents of the Marshall Islands have now migrated to the US due to the availability of a Compact of Free Association treaty between these two countries.

7.5. Therefore, new waves of displacement and migration will tend to follow pre-existing migration pathways. This is observed, for example, in south-west Bangladesh where displacees from severe cyclones in the 1980s established communities on common land on the edge of regional cities. The populations of these settlements then increased with those displaced by subsequent extreme storm events, including those from cyclones Sidr (2007), Aila (2009) and Amphan (2020).

7.6. Consequently, the majority of migration and displacement associated with climate change is likely to be ‘internal’ – within national borders – and is often relatively local, with rural populations relocating to nearby towns and cities.

7.7. Regional cross-border migration can also occur particularly where there are established migration pathways to regional cities. An example of this is pastoralists residing in Ethiopian borderlands displaced by drought crossing borders to seek opportunities in Nairobi, Kenya or communities from Pacific islands threatened by sea-level rise exploring options for resettlement in Fiji, New Zealand, and Australia.

8. Potential for climate change to reduce migration

8.1. There is also evidence that initial migration - particularly if it is ‘fragmentary’ or circular - can have a dampening effect on subsequent mobility from the place of origin[9]. The resulting flow of remittances can serve to bolster household adaptive

capacity, and thereby reduce subsequent migration in response to future sea-level rise impacts associated with climate change[30].

8.2. Migration requires both human and financial capital to undertake and therefore is not an option for the poorest households[3]. Those who have an aspiration to migrate may lack the resources, assets and networks to facilitate their relocation which is further exacerbated by the impacts associated with climate change, contributing to their immobility and resulting in 'trapped populations'[31,32]. From this perspective, climatic and environmental shocks therefore have the potential to influence both the individual's aspiration to migrate, and their capabilities to pursue this migration.

8.3. Therefore, there is increasing evidence that in certain locations, the impact of climate change will be to reduce and potentially arrest pre-existing migration flows.

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