THE IMPACT OF MIGRATION ON CULTURALLY-EMBEDDED AND SUBJECTIVE PERCEPTIONS OF HABITABILITY IN A CONTEXT OF ENVIRONMENTAL CHANGE. A CASE STUDY FROM NORTHERN GHANA

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Summary: Environmental change is increasingly challenging the habitability of places around the world, particularly with regard to resource-dependent rural areas in the Global South. Apart from objectively measurable, bio-physical indices, it is likewise important to look at individual and group-specific perceptions of habitability, which are embedded in their respective socio-cultural context(s). Migration as a well-established household risk diversification strategy has the potential to increase people's adaptive capacity, their well-being, and can shape the way people perceive the habitability of places. This study utilizes a human-centered approach in order to unravel the impacts of migration on culturally-embedded and subjective perceptions of habitability in a rural community in Northern Ghana which faces increasing pressure of environmental changes. Based on qualitative empirical research, we utilize place attachment, social status, and community cohesion as exemplary socio-cultural dimensions with particular relevance in this specific local context to showcase 1) the subjectivity and cultural embeddedness of habitability perceptions and 2) the respective potential of migration to influence such perceptions to both positive and negative ends. Positive migration impacts on the underlying socio-cultural context(s) can serve to undergird (collective) responsibility and adaptive action towards improving local habitability in parallel to encouraging efforts that strive to maintain cultural integrity. Integrating this knowledge in future habitability assessments can pave the way for context-sensitive and locally-adjusted resilience-building strategies that take the potential benefits and disadvantages of migration into account.

Keywords: Habitability, migration, environmental change, socio-cultural context, Northern Ghana

1 Introduction

Intensifying processes of environmental change are increasingly posing challenges to livelihoods around the world – particularly regarding vulnerable populations in the Global South (Adger et al. 2003, Thomas et al. 2019). Fittingly, fresque-baxter and Armitage (2012: 261) projected in 2012 that "*climate change will redefine the relationships people have with place*". About ten years later, the question of habitability is indeed moving into the center of the global climate change debate (Farbotko and Campbell 2022, Wrathall et al. 2023, Borderon et al. 2023). Besides objectively measurable indicators of habitability, like climate indices or socio-economic variables, it becomes increasingly clear that a comprehensive answer to the question of whether a particular place is habitable or not also has to involve the subjective experiences and perceptions of those that are affected by environmental change (farbotko and Campbell 2022, Moesinger 2019). This is important, given that environmental change adaptation and mitigation policies cannot be fully implemented without genuine approval and participation of its beneficiaries (Patt and Schröter 2008). Ultimately, perceptions of risk, the environment, and habitability, are mediated by the respective socio-cultural context they are situated in and thus mirror very localized cultural norms, values, and beliefs, which essentially determine the scope for adaptive action (Ayeb-Karlsson et al. 2019, Thomas et al. 2019, Deneulin and McGregor 2010, Adger et al. 2021).

One of the key societal strategies to deal with environmental risks is human migration, which has the potential to increase people's adaptive capacity, their well-being, and influences the way people perceive the habitability of places (Faist and Schade 2013, Horton et al. 2021, Adams and Adger 2013a). Migration as a dynamic social mechanism can impact individuals and communities in different ways and can contribute to shift the perceived boundaries of whether a place is considered to be habitable or not. Apart from tangible effects on the material conditions of livelihoods,

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for instance concerning remittances or new agricultural tools, migration also influences the underlying socio-cultural contexts (Salazar 2010, Adams and Adger 2013a, Adger et al. 2013, Qin and Flint 2012). As such, migration contributes to (re)produce these socio-cultural contexts, thereby simultaneously igniting socio-cultural change and shifting the boundaries of subjective habitability.

Adger et al. (2013: 112) have identified culture as a central analytical element to better understand the causes and meanings of, as well as corresponding human responses to environmental change, which also includes the utilization of migration. Notwithstanding the seemingly pivotal role of culture in human-environment interactions, Cote and Nightingale (2012: 479) have expressed some substantial critique regarding the continuous predominance of ecological principles in current approaches to study social dynamics, leaving important questions about the role of culture and power to the side more often than not. In hindsight, many of the existing portrayals of human-environment interactions have remained remarkably abstract and detached from real life-worlds, ostensibly omitting the fact that environmental change is a highly subjective matter (Hulme 2008, Offen 2014). This is particularly true for current research on habitability, which has often employed top-down, data- and model-driven approaches that "*tend to exclude the non-material, relational and culturally and socially specific elements of habitability*" (Farbotko and Campbell 2022: 187). Likewise, the role of migration in the light of environmental change has often been reduced to a rationalized cost-benefit strategy, which ignores the embedment of migration in the underlying socio-cultural context(s) as well as its interdependence with subjective perceptions and culturally-mediated aspirations (De Haas 2021, Parsons 2019, Adger et al. 2013). At last, it seems that socio-cultural dimensions *"still remain a significant missing piece of the puzzle"* (Wiederkehr et al. 2019: 11), which underlines the imperative need for new empirical insights.

This paper seeks to close this gap by analyzing the impact of migration on culturally-embedded and subjective perceptions of habitability. The research is based on a mixed-method qualitative fieldwork which has been carried out over six weeks in a rural and risk-exposed community in Northern Ghana. We apply a human-centered approach to habitability, which is informed by a socio-ecological systems perspective, and center the notion of perceptions from a socio-cultural point of view in an attempt to refine the utilization of habitability as a research lens. We consider place attachment, social status, and community cohesion as important socio-cultural mechanisms through which migration changes local perceptions of habitability. Comprehending both the relevancy of socio-cultural context and the mediating role of migration for subjective perceptions of habitability can foster our understanding of how societies render rapidly changing socio-ecological systems 'habitable'. By deliberately employing a perception-based habitability lens that centers the experiences of those affected by environmental change, we can circumvent the risk of delineating habitable places from a distance and avoid top-down processes that entail the disempowerment of local communities. An understanding of migration impacts on perceptions of habitability then also serves to facilitate the implementation of well-tailored approaches for increasing resilience and strengthens the level of acceptance for measures that will likely fail without an appropriate cultural background check.

In the following section, we provide a synopsis of hitherto research on cultural and subjective understandings of socio-ecological systems and migration, leading to the presentation of the underlying habitability framework in the third section. Fourth, we delineate our methodological approach before presenting our results in the fifth section. Lastly, we connect our results with existing studies that look at the interplay of migration, environmental and socio-cultural change, and discuss emerging implications for a human-centered framing of habitability.

2 Socio-cultural perspectives on habitability and migration

The concept of habitability is gaining importance in research on environmental and climate change (Farbotko and Campbell 2022, Duvat et al. 2021, Storlazzi et al. 2018, Horton et al. 2021). So far, however, the framework has not been subject to a great deal of critical scrutiny (Farbotko and Campbell 2022) and is often employed from a standpoint that centers changes in the natural environment, thereby neglecting the crucial human dimensions in coupled socio-ecological systems. For instance, the IPCC defines human habitability as "*the ability of a place to support human life by providing protection from hazards which challenge human survival, and by assuring adequate space, food and freshwater*"

(IPCC 2022: 2911). We contend that such definition, whilst certainly applicable in contexts of high or even existential risks (Kemp 2023, Huggel et al. 2022), is too narrowly focused on hazards and basic needs as the primary and unequivocal determinants for habitability. Duvat et al. (2021) expand this definition and identify context-specific variations of habitability across different islands, but they predominantly focus on material indices of habitability, likewise. In their paper, Horton et al. (2021: 1280) define habitability as "*the environmental conditions in a particular setting that support healthy human life, productive livelihoods, and sustainable intergenerational development*" and add that environmental change might compromise basic human survival, livelihood security and a society's capacity to manage risks. Our work builds on this contribution, which is also one of the first to relate habitability to human migration, but we approach habitability with the specific aim of expanding its socio-cultural and subjective notions.

Our understanding of habitability draws on socio-ecological systems (SES) research, which stresses that a separated analysis of social and ecological systems is inherently counterproductive (Berkes et al. 2003, Milkotreit et al. 2018). The current emphasis on *coupled* socio-ecological systems stems from increasingly critical assessments of resilience as a suitable lens to study social (inter) actions in natural systems (Cote and Nightingale 2011, Brown 2014, Davidson 2010, Brown and Westaway 2011). In addition, the persisting and disproportionate focus on the ecological side is somewhat thwarted by the assumption that the social ultimately acts as either catalyst or obstacle for transformative change in socio-ecological systems (Carr 2019). Further impetus for the social sciences to increasingly spearhead the scientific engagement with socio-ecological systems and resilience thinking is also given by the notion of (social) limits to human adaptation, as perceptions of risk, as well as the willingness and capacity to act, can be distributed differently across and within societies (Adger et al. 2009, Carr 2020, Dow et al. 2013). Nielsen and Reenberg (2010) speak of cultural barriers to adaptation for the Fulbe in Burkina Faso, as the quest to preserve their cultural identity limits the adoption of adaptive strategies, such as migration. In this vein, Deneulin and McGregor (2010) state that people's perceptions essentially determine their scope and intent for action, whereby such cognitive processes are ultimately coined by culturally-embedded values and norms. This notion is essential for grasping how different individuals perceive their environments and subsequently render specific locales 'habitable'.

Research on human migration as a dynamic social process that interacts with adaptive capacities and resilience has likewise experienced an increasing interest for human agency, subjective aspirations, and cultural peculiarities of movement and non-movement. Whilst earlier research on the Sustainable Livelihoods Approach (Ellis 2003, McDowell and De Haan 1997, De Haan 2000) or the New Economics of Labour Migration (Stark and Bloom 1985, Stark 1991, see Massey et al. 1993 for a review) has predominantly assessed migration as a livelihood strategy employed to improve household income and assets, with valuable contributions regarding our knowledge of potential migration impacts, these approaches have somewhat omitted the fact that migration is not merely a rational cost-benefit decision or a straightforward reaction to external stimuli, but rather involves differential perceptions of the environment, subjective decision-making, as well as socio-cultural and historically-embedded contexts (De Haas 2021, Martin et al. 2014, Abreu 2012). Whilst migration processes are inherently conditioned by the underlying socio-cultural contexts, migration also impacts those configurations and bears the potential to spark transformative social and cultural change (Castles 2012). Examining these effects is crucial for understanding subjective perceptions of habitability, as migration-ignited "*cultural change may generate new expectations about what are tolerable or intolerable risks*" (Dow et al. 2013: 6). Recent research contributions on the role of socio-cultural context for the environmental change-migration nexus (e.g. Parsons 2019, Adams 2016, Wiederkehr et al. 2019, Adams and Adger 2013b) have thus created a fertile ground to expand Horton et al.'s (2021) elaboration on the relation between migration and habitability.

A very important indicator for the evaluation of places and their habitability is place attachment, which can be defined as the bonds that people develop to places (Altman and Low 1992). Place attachment coincides with a multitude of related concepts, such as place identity, place dependence, rootedness, or sense of place (Lewicka 2011), and often involves highly emotional and intimate connections to places and their physical environment (Stedman 2003, Easthope 2009), the social interactions which are situated in places (Raymond et al. 2010, Trentelman 2009), and their respective

cultural, psychological, or spiritual attributions (Farbotko and McMichael 2019, Manzo and Devine-Wright 2014). When places are affected by environmental change, this usually entails a (re) negotiation of place-based identities and feelings of belonging, which is concomitant with a modified perception of the values and meanings ascribed to place (Fresque-Baxter and Armitage 2012, Cunsolo and Ellis 2018). Crucially, it has also been observed that pronounced levels of place attachment serve to ignite pro-environmental behaviour and adaptive action in order to preserve or improve the current level of place-based satisfaction (Khanian et al. 2019, Smith et al. 2012, Dlamini et al. 2021). When people have to leave a place behind, the habitual routines that they have developed in their accustomed surrounding, and the place-based identities they have formed as a result, will undergo significant changes, shaped both by the loss of the customary place and the experiences gained in new locations (Gustafson 2002, Kelly 2009, Tschakert and Tutu 2010). Whilst migration is often assumed to negatively interfere with place attachment, it quite generally contributes to "*re-create, maintain or change place attachment*" (Di Masso et al. 2019: 130). Positive ties to a place of origin that arise from social relations, positive memories, and a sense of security and safety can serve as major impetus for (repeatedly) returning home (Njwambe et al. 2019, Riethmüller et al. 2021, Islam and Herbeck 2013) or remaining in situ in the first place (Farbotko 2018, Khanian et al. 2019, Rabbani et al. 2022). Following from these insights is the assumption that both migration and (in)voluntary immobility interact with place attachment, which in turn holds potential to affect subjective perceptions of habitability.

Strong people-place bonds are closely related to the quality and continuity of social interactions (Raymond et al. 2010, Trentelman 2009, Lewicka 2011). Because "*place attachment and collective action mutually reinforce each other*" (Blondin 2021: 299), this serves to open up a critical connection between place attachment and community cohesion that also affects subjective perceptions of habitability. Knowing one's neighbor, having access to extended family networks, and enjoying the benefits of interpersonal connections provide for both livelihood security and personal comfort, particularly in rural communities (Theodori and Theodori 2014). For instance, Qin and Flint (2012: 5) expound on the relationship between an intact level of community cohesion and habitability: "*When higher community interaction leads to improved community structure and quality of life, individual households are more likely to achieve livelihood security*." Migration has been found to impact levels of community cohesion, either by weakening existing social support systems, or by bringing the remaining members of the community closer together (Demi et al. 2009, Adger et al. 2013, Qin and Flint 2012). In case increasing out-migration weakens community resilience and reduces the availability of human resources, for instance through a loss of workforce and the departure of community leaders (Demi et al. 2009, Upadhyay et al. 2023), subjective perceptions of habitability can be affected, likewise.

Lastly, another important determinant of subjective perceptions of place and corresponding place-based well-being is the standing of an individual in a social group, which can be analyzed by using the notion of social status (Anderson et al. 2012). Whilst many studies have rather focused on the material dimensions of social status thus far, comprising for instance markers of income and wealth, we specifically focus on what Anderson et al. (2001) term sociometric status, which circumscribes the level of prestige, respect, and admiration that individuals hold in their localized face-to-face groups. Such a characterization of social status is an important marker of personal identity and delineates both the permitted and the prohibited scope for socially accepted practices (Ungruhe 2010). The actual relevancy of social status is differentiated across socio-cultural contexts and also interacts with migration. According to De Haas (2021), migration can be utilized as a means to prove masculinity and can serve as rite of passage, earmarked by respect and admiration in case of a successful accomplishment. In many contemporary African societies, such as in Salazar's (2010) example of Tanzania or the cases of Schraven and Rademacher-Schulz (2015) and Ungruhe (2010, 2011) in Ghana, migration is often correlated with upward socio-economic mobility and embodies perceptions of an urbanized and powerful identity. As a result, return migrants often emerge as highly respected carriers that can implement recently acquired knowledge to the benefit of the whole community, illustrating their potential as "*active agents of collective community response to ecological problems*" (Qin and Flint 2012: 7). As such, social status, along with place attachment and community cohesion, can serve as marker of a place-specific socio-cultural context that – by interacting with migration - contributes to alter subjective perceptions of habitability.

3 Conceptual approach

In this research, we use a perception-based framework of habitability that has the ability to incorporate conceptions and ideas from both physical and social sciences. Based on the HABITABLE[1] working definition (Gemenne et al. 2021), we define habitability as the capacity or capability of a socio-ecological system to sustain and support the lives and livelihoods of its constituent population(s), which comprises both the material and immaterial properties of places and explicitly involves a subjective component. With this definition, the habitability of a given locale is thus based on both ecological, physical properties of a place and comprises the perceived, experienced, and (co-)constructed social structures, emphasizing that habitability is ultimately based on the lived realities of the respective population(s). To explain this inherent subjectivity of habitability, we can take a look at the semi-arid regions of the Sahel, which are not considered habitable for sedentary farmers relying on rain-fed agriculture, but perfectly so for pastoralist communities, such as the Touareg. In this case, the very specific socio-cultural embedding and historically evolved adaptive capacities of the Touareg render seemingly uninhabitable spaces suitable for living. Indeed, individual perceptions, experiences, and worldviews represent an increasingly important area of research for human-environment interactions (Parsons and Nielsen 2021, Artur and Hillhorst 2012, Guodaar et al. 2021, Ayanlade et al. 2017, Wiegel et al. 2021). This is particularly due to the fact that objectively measurable, bio-physical indices of climate change are not enough to 1) explain the observed variations in people's (migratory) responses to increasing environmental risks (Martin et al. 2014, Ayeb-Karlsson et al. 2019, Parsons and Chann 2019, Parsons and Nielsen 2021) and to 2) justify the design and implementation of resilience-building strategies from a top-down position that do not incorporate affected communities' beliefs, values, and desires (Farbotko and Campbell 2022, Moesinger 2019, Patt and Schröter 2008).

Hence, we agree with Parsons and Nielsen (2021: 972), who argue that environmental perceptions, albeit not an exact science, should be integrated as "*an important sphere of research in their own right when wanting to understand the local impacts of climate change, as well as adaptation measures such as migration*". These considerations can be easily conferred to habitability, which should not be regarded as a scientifically-proven marker of places according to an 'objective truth', but much rather as *"a choice that people make*" (Wrathall et al. 2023: 1). A milestone publication in advancing our thinking about habitability has been put forward by Farbotko and Campbell (2022). They tackle the question of who actually has the right to define the habitability of Pacific atolls, places where concerns about future liveability are arguably most warranted. The authors propose to place affected populations and their culturally-embedded worldviews at the center of corresponding scientific analyses, given that their subjective perceptions of habitability encompass wider notions of a 'livable place' compared to assessments which are solely based on bio-physical indices. In our conceptualization of habitability, we confer with their arguments and propose a human-centered and perception-based framing of habitability that is appropriate to uncover the "*deeply human assemblages of sociocultural, institutional, and biotic elements*" (Carr 2020: 6) in socio-ecological systems altogether. Whilst the subjectivity of habitability is differentiated along multiple axes (Merschroth et al. 2024), we specifically focus on the importance of the underlying socio-cultural context(s).

With regard to socio-cultural context(s), we utilize the delineation of Adger et al. (2013: 112), who define cultural aspects as "*the symbols that express meaning, including beliefs, rituals, art and stories that create collective outlooks and behaviours*" and tally with the idea that "*climate change threatens cultural dimensions of lives and livelihoods that include the material and lived aspects of culture, identity, community cohesion and sense of place.*" A much broader scope by Thomas et al. (2019: 8), defining culture as "*the shared and patterned meanings held by members of social groups*", also aids our understanding of culture as mutually agreed and collectively expressed practices that are bound up in certain social groups whilst at the same time overlapping and co-evolving in reciprocal relation to other cultural frames. We specifically focus on place attachment, social status, and community cohesion as socio-cultural dimensions of seminal meaning in the specific local setting and foreground their relevancy for subjective perceptions of habitability. Our situation of the socio-cultural context within the notion of subjective perceptions of habitability is rooted in the idea that "*the 'well-lived life' is in significant measure culturally defined and is likely to find a different realization among*

[1] This research was conducted within the frame of HABITABLE (Linking Climate Change, Habitability and Social Tipping Points: Scenarios for Climate Migration), an EU-funded project aiming to advance the understanding of the interlinkages between climate impacts, migration, and displacement patterns.

Alaska Natives, Chesapeake Bay watermen, and Oakland urbanites" (Thomas et al. 2019: 10), emphasizing that diverse cultural contexts also condition different conceptions of what a habitable place is. In addition to steering perceptions of the environment and habitability, the underlying socio-cultural context also determines how people "*act according to the socio-cultural acceptance of choices before them*" (Martin et al. 2014: 91). Following this, and in order to achieve acceptance and durable participation for measures aiming to improve or maintain habitability, it is crucial to incorporate existing socio-cultural peculiarities.

The underlying framework is based on many years of research on socio-ecological systems and derives rich insights from prior studies. These incorporate, inter alia, research on place utility (Adams and Adger 2013a, 2013b, Adams 2016), nature's contribution to people (Díaz et al. 2018, Wiederkehr et al. 2019), human carrying capacity (Warner et al. 2010), and (societal) limits to adaptation (Dow et al. 2013, Adger et al. 2009). For example, the idea of place utility is providing helpful insights for a habitability-based lens, given that Adams and Adger (2013a, 2013b) and Adams (2016) argue that the quality of places is crucial for the respective in-situ satisfaction of a given social group and also informs decision-making on adaptive strategies, such as migration. Another study by Warner et al. (2010) draws on the concept of carrying capacity in a similar context, whereby they assert that carrying capacity has to be recognized as a function of cultural and natural features altogether. Human carrying capacity, however, has been criticized for providing a rather deterministic framing (Cote and Nightingale 2011, Sayre 2008). In our approach to habitability, we thus aim to include both material and non-material contributions to livelihood resilience and specifically focus on subjective and culturally-embedded perceptions. Hence, we are able to conceptually comply with the imperative need to bring "*hard, structural dynamics*" and "*softer intimate and normative dimensions*" (Parsons 2019: 10) closer together in a framework that is first and foremost based on locally-anchored, subjective accounts of those who are affected by environmental change the most.

Migration interacts with habitability in a double-tracked fashion. First, migration as a vital household-based adaptation strategy involves perceptions of risk and an assessment of a locales' underlying habitability (Parsons and Nielsen 2021, Wrathall et al. 2023, Adger et al. 2021, Horton et al. 2021). This implies that shifting levels of habitability can also alter migration patterns, for instance by reducing migration flows or by changing the seasonal character of mobility. Studies that link subjective perceptions of the environment with human (im)mobility are only recently gaining ground and represent an important area of research if we aim to understand the emerging migration dynamics under changing environmental conditions (Parsons and Nielsen 2021, Parsons and Chann 2019, De Longueville et al. 2020, Wiegel et al. 2021). Secondly, migration also has the ability to influence habitability by contributing to heightened or lowered levels of resilience and by mitigating changes in ecosystem service provision (Adams and Adger 2013a, Black et al. 2011), but also by impacting the socio-cultural aspects of habitability perceptions, by shifting norms and values, and thereby igniting social and cultural change (Nowok et al. 2013, Castles 2012). In this paper, we specifically focus on the latter aspect and show how migration can alter subjective perceptions of habitability by interacting with the underlying socio-cultural context.

4 Study design and methods

Based on our research framework, a qualitative mixed-method approach has been implemented to collect empirical data for the study, which also acknowledges the need for flexibility (Klenk and Meehan 2015) during the fieldwork. Whilst the first phase of data collection placed a particular focus on the changes of local environmental conditions and the underlying socio-cultural context in the last 20 years – including the respective relevancy for subjective perceptions of habitability – the second phase turned towards the impact of migration. We purposefully kept the delineation of 'what environmental change is' and which changes emerge to be relevant for local habitability up to respondent's experiences and understandings. Resulting from this initial phase of data collection, we identified social status, community cohesion, and place attachment as exemplary markers of the underlying socio-cultural context that yielded the highest consensus amongst participants with regard to their relevancy for subjective perceptions of habitability.

The empirical fieldwork was carried out in a rural Dagomba community in the Tolon district of Northern Ghana between August and September 2022 by the first and last author of the paper. Exposure to environmental and climate risks, the prevalence of resource-dependent livelihoods, as well as the historically-embedded importance of

migration were criteria which guided the site selection. The research area is located in the West African Guinea savannah belt, characterized by a unimodal rainfall regime with one annual rainy season, usually from April/May to October, and a dry season from November to late April. The large majority of the population is dependent on rain-fed subsistence agriculture and major crops include maize, beans, groundnuts, guinea corn, and rice. Participants estimated the size of the community with 3000 to 4000 inhabitants, a number that has been exponentially growing in the last 20 years. Whilst the location is quite remote, amendments in infrastructure, road networks, and motorized transport have improved access to marketplaces and the regional capital, Tamale. Migration is highly prevalent and plays a vital role for livelihood security, which will be examined more closely in the following chapter.

It was our aim to gather information on both community as well as individual levels of analysis to emphasize both collective as well as individual interpretations of habitability. In total, 26 semi-structured interviews (SSI), 10 expert (EI) or key informant (KII) interviews, 2 focus group discussions (FGD), 2 transect walks (TW) and 5 participatory walking journals (PWJ) were conducted, involving 25 males and 17 females, excluding the FGDs. Whereas expert interviews involved scientific experts on topics of migration as well as socio-cultural and environmental change in Northern Ghana, key informants circumscribe essential actors in the Dagomba culture, such as women's leaders, spiritual entities, medical practitioners, or intermediaries of the local chieftaincy. The utilization of participatory walking journals is derived from Tschakert et al. (2013) and constitutes a mobile interviewing technique employed to understand participants positioning in place. Through 'peripatetic interviewing' (Wiederhold 2015) and 'knowing by walking' (Ingold 2010), participants can actively situate themselves within their surrounding and can show places, objects, or formations of thought that are of relevance to their own perception of habitability, migration, and cultural identity. The data were later digitalized, transcribed, and clustered into segments of results using MAXQDA coding software, utilizing both inductive and deductive coding.

Participant selection was based on purposive sampling, which envisages a diversified display of the community with regard to age, gender, socio-economic standing, and migration background. We placed a particular focus on the latter aspect with the intention to delineate an expressive community migration profile. The selection thus included current migrants (visiting home at the moment or migrated in the last year), former migrants (returned for a period of one or more years already), and non-migratory actors altogether. The latter group comprises those segments of the population that are immobile, either voluntarily or involuntarily. Through purposive sampling, we also attempted to cater for a gender balance in our data. Given that female migration is increasingly common in Northern Ghana, the resulting gender-specific implications hold high potential to explain diverging perceptions of habitability. Different age groups that displayed dissimilar attitudes towards habitability, culture, and migration were included, likewise. The age of respondents ranged from 18 to 67, which enables us to integrate a generational angle.

The data collection process was undertaken with the help of two research facilitators and involved the simultaneous translation of respondents' information from Dagbani to English to enable follow-up questions and situation-specific adjustments. The research facilitators were both Dagomba and familiar with the local dialect, prevalent customs and norms, and with approaching sensitive topics in an appropriate manner. Empirical fieldwork also has to involve a thorough consideration for the positioning of the researcher and awareness for distinct cultural differences that can hamper a smooth proceeding of the research cycle. Next to cultural and language barriers, some of the socio-cultural dimensions, and important linkages between them, might represent tacit taboos. In addition, some aspects will remain hidden because respondents will not perceive them to be 'relevant' according to their understanding of the world, or because they are not knowledgeable on specific topics. Because societies in Northern Ghana in particular uphold a very pronounced esteem for respect, family relations, and spirituality, people can be reluctant to speak about certain issues and will be wary to talk critically about their own culture and other community members. In an empirical setting, it is also crucial to consider the expectations of participants vis-à-vis the research team. Participants might attempt to 'earn' something by interacting or could perceive the presence of researchers as a threat, which is why a closer look at the existing social configurations and power structures in situ is indispensable. This research has placed a specific focus on in-depth preparation as well as on iterative processes of critical reflection, which has helped to mediate some of these barriers.

5 Results

5.1 General perceptions of habitability and the role of environmental change

The majority of participants perceived a rather positive overall development of habitability over the last 20 years, which is pertaining to a steady enhancement with regard to the material means necessary to sustain a living. Such changes most prominently mirrored a range of infrastructural developments, for instance regarding the extension of road networks, a surge in motorized vehicles, the set-up of electricity and network, a recent supply of mechanized boreholes that facilitate access to water, the set-up of a small clinic for basic health care, and the provision of a high school. These amendments are reinforced by the spawning of small-scale enterprises, which showcases a recent growth in economic capabilities and an ongoing process of diversification. Perhaps the most salient change concerns the increasing build-up of 'modern' block houses that slowly start to refurbish the community landscape and offer better protection from recurring floods and storms. Whilst these changes were positive for the general perceptions of habitability for most respondents, few participants also remarked negative developments. This especially includes those households that had been struck by environmental change impacts for consecutive years or those that did not exhibit a diversified livelihood portfolio. Moreover, households where the demographic composition was weakened through a surplus of elderly persons, the death of key household members, or unsuccessful migration journeys perceived a decline in habitability, likewise. Taken together, these accounts showcase that subjective and socially differentiated perceptions of habitability have to be considered on an individual level (see also Merschroth et al. 2024), even though positive assessments prevail on a community scale. Crucially, many of those changes in the perceptions of habitability have been greatly influenced by migration.

Quite generally, people spoke in a different tone when considering the dry season when the green scenery and bustling atmosphere of agricultural productivity and trade makes way to barren soil, water shortages, and tedium. This is amplified by increasingly palpable impacts of environmental change on a community that is still first and foremost dependent on the state of the surrounding ecological system. Almost all respondents mentioned droughts and floods as recurrent phenomena, entailing the destruction of crops and igniting food insecurity. Many participants also mentioned that storm frequency and intensity has aggravated over the last 20 years, affecting the quality of crops and causing damage to housing and other infrastructure. However, and despite the fact that the study was carried out in a single community, participants were not affected homogenously by environmental impacts. Whilst one respondent stated that "*my farm has been affected by floods in the last 3 years. Where I farm my beans and when the flood came, it took everything away, flooded everything and washed it all away*" (SSI1)[2], another interviewee explained that "*I have never been affected by flood where I am farming, but drought is surely affecting me negatively*" (SSI5). A partial explanation for these different perceptions of environmental change impacts can be drawn from the fact that some community members own fields in closer proximity to the river and are thus a lot more vulnerable to flooding. Consistent was the shared assessment among all respondents that rainfall has grown increasingly erratic in nature. Moreover, the onset and offset of the rainy season has shifted as well, leading to a scenario where farming is correlated to a high level of insecurity with fluctuating yield output from season to season. Some participants also mentioned a steady increase in temperature, particularly concerning the dry season. This is consistent with existing data on climate change in Northern Ghana. According to the Third National Communication Report to the UNFCCC by the Republic of Ghana (2015), an increasing variability of rainfall and rising temperatures are observable for the whole country since 1960, with this trend expected to continue until 2080. The report also identified a projected decrease of rainfall and an increase in temperature for the Guinea Savanna Zone, where the spread of change and the potential variability is particularly pronounced (Republic of Ghana 2015). Our observed trends are furthermore confirmed by other works analyzing perceptions of environmental change in Northern Ghana (Goudaar et al. 2021, Asare-Nuamah and Botchway 2019, Teye et al. 2015).

There was comprehensive agreement among all respondents that soil degradation and a loss of soil fertility was the major environmental driving force for negative perceptions of local habitability. One participant explains the impact of degradation like

[2] SSI refers to semi-structured interview. Further abbreviations include FGD (focus group discussion), PWJ (participatory walking journal), EI (expert interview), KII (key informant interview), and TW (transect walk).

this: "*There is a decrease in soil fertility and the soil is acidic now. When you plant something it cannot grow and it results in the development of bad weeds that make the fruits go pale and yellowish*" (SSI1). Most participants blamed human mismanagement, for instance regarding extensive deforestation in recent years, and an overuse of fertilizer. The latter aspect seems to open up a devilish cycle where more chemical inputs are needed annually in order to produce a sustainable amount of crops. Changing environmental conditions thus seem to be aggravated by human malpractices, which also concerns the increasing occurrence of floods: "*Without the trees at the river banks, which have been cleared for farmland, the river is not kept in check anymore and water can transcend to the fields more easily*" (FGD1). Most respondents in this study were highly perceptive of the close relation between human practices and environmental feedbacks in this area. The fact that a large share of participants still perceived a positive general trend of habitability can partly be explained with the improvement of technological and infrastructural means, serving to offset some of the negative impacts. Altogether, however, environmental change was the main aspect seriously dampening participant's perceptions of habitability, which is why we proceed to assess the impact of migration on culturally-embedded and subjective perceptions of habitability to be situated in a context of environmental change.

5.2 Migration as institutionalized strategy that shapes habitability perceptions

Migration as a dynamic social mechanism of adaptation and livelihood sustenance is highly present in the community. In the local language, migration is called travel, and is perceived to be exactly that: A travel into the unknown, into faraway lands that are dangerous, exciting, and intriguing at the same time. Migration pathways were predominantly rural-urban and most of the trajectories led into the urban centers of Tamale, Accra, or Kumasi. A few respondents also indicated to move towards more favorable agricultural areas in Southern Ghana. Migration has been present throughout the community's long history and is not a new phenomenon. However, local accounts suggest a recent increase of migration over the last 20 years with regard to absolute numbers, which people mainly ascribe to the growth in population. Contrariwise, some respondents also perceived a relative decrease in migration, which they related to the increasing quality of living by means of infrastructural improvements. As a result of these perceived changes in habitability, some participants argued that the need to migrate has tapered off, and many respondents accentuated their conscious decision to return to or stay in the community despite increasing environmental challenges.

Migration follows a seasonal and cyclic rhythm for the large majority of movements. Households 'offset' parts of their members in the dry season when farming is only feasible to a fairly limited extent in order to diversify the livelihood portfolio, create additional income opportunities, and have fewer mouths to feed. Most of those migrants return home before the start of the rainy season. Some people have also left the village for permanent migration, both within Ghana or abroad, and now utilize this position to assist their household members left behind. Both men and women migrate and movement is normalized for both genders, but male migration is often favored due to the prescribed female role as caretaker for children and the elderly. Generally, migration is perceived mostly positive as it has facilitated many of the abovementioned material improvements, for instance regarding the introduction of mobile phones, motorbikes, pointed roofs, modern-style block houses, or toilet facilities. Respondents argued that all of these amenities were experienced by migrants that went 'down South', and the subsequent in situ implementation has contributed to an increasingly positive evaluation of habitability in the research locale. Migration also greatly contributes to the material needs of households through monetary and food remittances, which are either sent from the destination areas or brought home upon the eventual return. The latter form of remittances is quite popular in Ghana (Luginaah et al. 2009, Kuuire et al. 2016) and greatly enhances food security. Nevertheless, community members were also very aware that migration is a highly risky undertaking and always comes with certain tradeoffs. Negative impacts pertained to high expectations on migrants' shoulders, a loss of workforce, and high costs that can see households blunder into a dangerous spiral of financial trouble. Besides the potential of migration to affect the material means necessary to sustain a living, it has to be equally emphasized that migration also impacts existing socio-cultural configurations. This has crucial implications for perceptions of habitability and plays a vital role for fully comprehending local strategies of livelihood sustenance in complex socio-ecological systems.

5.3 The impact of migration on culturally-embedded and subjective perceptions of habitability

5.3.1 Migration evokes declining levels of community cohesion and support

Next to the abovementioned range of tangible and material changes that led to both positive and negative shifts in subjective habitability, the community also underwent significant socio-cultural transformations over the last 20 years that influenced the satisfaction of participants with the study locale. Respondents firmly bemoaned the apparent loss of community cohesion and togetherness, which have been declining strongly in the last 20 years. People correlated this loss with a) the onset of 'modernity' and b) with out-migration from the community, and nostalgically remembered the 'good, olden days' when people used to gather more frequently, providing a space to share both physical and mental burdens with others. There is an important generational angle regarding the loss of community cohesion, as elderly community members were more knowledgeable about social support structures in the past and were generally more inclined to perceive a decrease in social interactions. However, even amongst the younger generation, a large share perceived a distinct loss of cohesion, which is contrasted by only a few statements claiming an intact level of intra-community support. Altogether, the decline in community cohesion was perceived to influence habitability negatively, and effects included weakened abilities to cope with environmental stress ("*the way that we were helping each other in the past, you could then still cope even if resources were less*" (SSI3)) or were relating to social contacts and interactions that were considered to be very important for rendering the study locale habitable ("*I have built relations here: the family, friends, and other relations, they are really important to me. The networks that I have here are one of the key reasons that are making the place livable*" (SSI2)).

Many respondents indeed identified migration as the main driver for this loss of cohesion. The most direct manifestation of this impact comprises the absence of community members, which puts a considerable strain on social relations and community networks. One female respondent recalls that "*the time that we used together to sweep the compounds, to work together on the farm and to eat together in the night, it is not there anymore. It is migration!*" (SSI6). Migration was perceived to be a necessity in order to cope with increasing environmental challenges, corresponding reductions in yields, and food insecurity, but was also asserted as a trade-off with regard to intra-community relations. One farmer summarizes this dilemma in the following way: "*Here, it is only farming and people need to create another avenue of income and security for their livelihood. But then the cohesion is loosened. (…). This is a deep incision into support systems*" (SSI26). People were well aware that "*if you have the cohesion and support, you can achieve more*" (SSI26), but this could not circumvent the shared need to migrate in order to provide the means necessary to sustain a living.

In many cases, the lack of people in the community, especially during the dry season when many opted for seasonal strategies of movement, was connected to a reduction in togetherness, which holds true for family, friendship, and neighborhood connections alike. For instance, people would not come together for meals anymore, laughter and joy would give way to a silent void, and common places of social encounter were left vacant. Popular statements in this vein included "*the community is more empty and quiet*" (SSI17), or "*when they go, the place becomes virtually empty and the place is not enjoyable anymore*" (PWJ2). One participant expressed his disappointment quite forthright and also brought up the respective impact on his subjective perceptions of habitability: "*When all of them go, the community becomes like an empty shell. (…). The community is empty and nobody is there, so it is very bad for my quality of life and it decreases the value of the place*" (SSI21). Crucially, a loss of cohesion due to the permanent or repeated absence of persons was also correlated with a decline in communal labor and intra-community activities. This can have serious repercussions for collective action capacities, intra-community support, and the provision of safety nets, especially concerning potential impacts of environmental change. For instance, in order to build or repair the traditional round houses, particularly after storm or flooding damages, additional labor is required, but the loss of support makes it difficult to find enough participants: "*Migration actually destroys community cohesion. The buildings of my house for example, they are all locally created. To build them, you need people to help and set them up. If your kids are away in Accra, then you would need to beg other people for support. But when you go to another household for support, then the household would say 'you sent your kid away to Accra, and why should my kid let his work slip and help you?'*" (SSI15).

Some respondents also argued that the loss of cohesion and togetherness perpetuates when migrants return home again. Such accounts mostly posited that migrants are contributing to form new social groups and prefer to remain amongst each

other. In particular, the introduction of negative practices such as smoking, drinking, and drug abuse by migrants has led the way for (re)producing new social formations and has contributed to tear family, kinship, and friendship networks apart. Hence, the overall evaluation of migration impacts on community cohesion was overwhelmingly negative. This was deemed to be very relevant for subjective perceptions of habitability, up to a degree where some people even considered out-migration as a result. An articulate comparison is given by a return migrant who has been confronted with increased out-migration in his own circle: "*Migration is a temporal death or loss of a loved one. We have lost a loved one, you are now not enjoying the same quality of life and it hurts*" (SSI20). Findings like these are highly relevant for strategies of planned adaptation and migration governance due to the risk of breaking down vital support systems that undergird the resilience of individuals, households, and communities alike.

5.3.2 Place attachment undergirds subjective perceptions of habitability and serves to (re) direct migration impacts

Particularly important in the community, and in Northern Ghana in general, is the concept of place attachment. Almost throughout, participants exhibited a high level of place attachment and a strong bond to the village. When we asked people for the reasons for this attachment, one respondent quite blatantly asserted "*because here are my roots*" (SSI5), whereby the weight of this statement cannot be underemphasized in this particular cultural context. The birthplace has a very deep meaning in the local Dagomba culture and is tied to certain responsibilities and obligations, which are differentiated by gender and age. This is exemplified by the 'hometown concept' that was elucidated in one of the expert interviews: "*There is a high level of pride in the region and people want to uphold their family lineages. Thus, we have a high level of place attachment and people strongly believe in their traditions and the hometown concept. The hometown concept especially emphasizes that people want to stick to their hometown and want to make it great*" (EI2). When we asked one expert about the most important marker of the underlying socio-cultural context in the local setting, the answer was simple: "*It is identity. (…). For you to assert your importance, it is connected to your roots. (…). Our societies are not easily assimilative, where your parents come from, it will always define you. This is a major reason for the high attachment*" (EI6). Indeed, place attachment was also perceived as the most important socio-cultural dimension by the respondents. The bonds associated with the place of origin even serve to eclipse negative environmental impacts, as "*people live in certain places, even when they are not habitable, because of their attachment*" (EI6), which reaffirms the relative importance of place attachment for subjective perceptions of habitability in Northern Ghana.

The analogy of one research participant vividly depicts this nexus. He compared his place attachment with water, which is neutral, essential, and always has to be present for a dignified life. When sugar is added to water, then you can enjoy a cup of tea, and when water is mixed with salt, the result is a soup. For the respondent, both soup and tea symbolized all the various material developments transpiring over the years within the community. But ultimately, the basis of his habitability is the love for the place that he calls home. He states that "*even when all the other developments were not there, no electricity, no water, no network tower, I would still be here. I built a solar cell on the place by the riverside and I use it to transport water to the place where I stay. And I did it without government help, I did it because of place attachment. It is the most important and basic thing. It comes before everything else*" (SSI20). Place attachment in this local context is a deeply rooted feeling of connection with and belonging to a place, which comes from within and cannot be shaken by merely adding 'sugar' or 'salt'. Place attachment is thus very relevant with regard to subjective perceptions of habitability and the affection for the place determined many life-course decisions of respondents to a great extent.

Migration can have a profound impact on place attachment and evokes a process of cognitive reflection about conceptions of 'home' and 'away'. Former migrants often explained that their 'travels' in fact increased their attachment to the community. These respondents frequently highlighted that they have come to appreciate the peacefulness and tranquility of the area, especially when compared to the loud, hectic, and arduous atmosphere in the urban centers of Southern Ghana. By way of example, one participant stated that "*migration has even aided to increase my attachment to this place. When I went, I learned a lot more about other places and other people. I learned that this place here is very peaceful and that it is an important place*" (SSI14). Perceptions of other places eventually found their expression in the collectively shared conception of migration as a risky, dangerous, and challenging gamble that was not for the faint of heart. Particularly with regard to the urban jungles in Accra, Tamale, or Kumasi, respondents narrated enthralling stories

about hard work, luck, persistence, and perilous conditions that had to be overcome in order to provide for the household and render the costly migration venture a success. During one of the participatory walking journals, a respondent inducted us into the compelling narrative of his time in Accra that was characterized by severe hardship and dire straits. Growing with these experiences, he told us: *"When you look at the trip to Accra, it rather increased my attachment to this place. (…). The job is very risky in nature and the prospects of having a safe and peaceful area here in the community are better, I was realizing that more and more. So I am very happy to be here now and my attachment has grown*" (PWJ3). Associations of jeopardy and precariousness often contributed to view the place of origin in a different light, mostly from a lens that increasingly rediscovers positive characteristics.

People were also exhibiting high levels of place attachment because of their family, relatives, and friends, and a prolonged absence due to migration invoked feelings of homesickness and loss that correlated with the breakdown of social contacts. Such negative feelings of grievance were present in many peoples' narrations and were vividly emphasized by one respondent, explaining that "*when you are away for longer times, you feel a loss of home, you lose your identity*" (SSI20). Whilst being away, many former migrants recalled that they missed their family and longed for the time spent together in the community. For example, one respondent argued: "*Even when I was in Accra, I have the community at heart all the time. Whenever I have not been part of a wedding or a naming ceremony, I feel like I missed something and it's not nice for me. I will stay here in the future*" (PWJ4). As such, place attachment is closely related to social relationships and the meaning that is ascribed to an intact level of community cohesion.

Whilst migration was profoundly impacting feelings of attachment on the one hand, the historic prevalence of deeply-rooted feelings of belonging also contributed to steer and (re)direct migration impacts back towards the 'hometown' as central anchorage point, which can be summarized as follows: "*Despite Kumasi being nice, it is not my hometown and I had to go back to my hometown*" (SSI20). Return migration resulting, amongst other things, from place attachment then serves to revitalize seemingly lost place-based bonds to the community of origin and can improve well-being for both the respective migrants and those that were left behind. Moreover, the collectively shared affection for the 'hometown' also correlates with social status, leading to a scenario where the love for the community, the 'wish to build something here', and the desire to obtain a corresponding social status merge and ultimately entail well-rooted return ambitions for a considerable share of migrants.

5.3.3 Migration can yield a respected social status that serves to influence subjective perceptions of habitability

Owning a high social status holds a high value in the community, and the relevancy of a prestigious social position was clearly palpable: The possession of big houses, cars, and motorbikes, or the status of being a successful businessman, farmer, or 'traveler', was highly admired and proudly shown. Social status has always had a very unique meaning in traditional northern Ghanaian societies but has changed insofar as there are now a lot more people with a high social status in the community. This evolution was ascribed to a) an overall increase in the population, b) the augmented range of options to distinguish oneself from the other, and c) the fact that more people have migrated. In addition, women increasingly make use of the opportunity to earn an esteemed social position for themselves as a means to escape patriarchal structures. Social status exists on many different levels in the community, pertaining to the hierarchical social organization, but we especially focus on the social status that can be acquired (or lost) with regard to migration. Compared to the relative weight of place attachment and community cohesion as proxys for subjective perceptions of habitability, the importance of social status was subject to more ambiguity. Some respondents also downplayed the role of social status, for instance by arguing that being respected is not 'what brings food on the table'. Specifically for the younger generation though, a migration-induced social status symbolizes the successful accomplishment of a rite of passage. The fact that migrants are held in high esteem is based on the assumption that a migrant is a person that has been outside of the village and has seen the world, which is correlated to gains in knowledge and experience. The following remark on the role of social status in Northern Ghana, brought up in one of the expert interviews, appropriately sets the frame for the results discovered during the empirical field work: "*Migration is very relevant for status. You can acquire material resources and money with migration and if you come back, you are recognized as an important member of society and the community life. (…). Because if you come back from migration, it shows that a person was able to go into the 'wilderness', the stress and hustle of the city, and was successful. So migrants are*

important and respected members of society" (EI3). Being a respected member of society also interlinks with subjective perceptions of habitability, as satisfaction and a sense of security can be drawn from one's position in a social group.

Crucially, a migration-induced social status is inherently dependent on the success of migration and whether the person has brought a benefit to the respective household or the community at large. The potential hopes and gains associated with migration, comparable to the image of an adventurer on a voyage who is leaving the protective harbor and is sailing into the unknown, are deeply entrenched in people's minds. One respondent circumscribed these intentions with the words "*go to hunt and feed home*" (SSI23), which depicts migration as a form of hunting in the nebulous and perilous bush. Accordingly, stakes are quite high and there is a pronounced dichotomy between those who live up to the expectations and those who do not. A common proverb in the local Dagbani language goes "*When you send a child on a journey and he/she delays, but comes back with a ripe fruit, it is better than when the child comes back early without any delay, but with an unripe fruit*" (SSI26), which underlines the expectations that are put on migrants' shoulders. A successful return in the form of a 'ripe fruit' is ultimately preferred in contrast to an 'unripe' return, even if that is at the cost of the household member being away for a prolonged period. When the anticipation for prospective prosperousness is not met, the verdicts from family and friends can be harsh at times. This goes to such lengths that unsuccessful migrants are exposed to both intra-household and even public shame, whilst those that returned home successfully are highly admired and respected.

During one of the participatory walking journals, a respondent led us to three different houses that were tied to three different stories of migration, which schematize the dichotomy between triumphant 'travels' and those that had been for no avail. First, the respondent guided us to a house that appeared quite ordinary at first glance. One of the household members had been on a 'travel' and returned empty handed. In the weeks following his return, he was shy to move out of his house because people would talk negatively about him, which made him abide in his room for quite some time. Our second stop appeared quite similar to the first, but on second sight we spotted that a part of this house was painted in flamboyant pink colors. This part of the house belonged to another migrant, more successful than the previous 'traveler'. Once he returned, he was not only able to color his house to show his material gains, but also proceeded to furnish his room in an urban-inspired style. Lastly, we were guided to another homestead which immediately stood out due to the large and modern housing structure adjacent to it. In this case, the migrant was very successful and could finance the build-up of this salient structure. Moreover, this person was also able to acquire a new motorbike during his journey, which he brought back to the village and now proudly showcases in public. Whilst the first migrant was rather shamed as his trip was all in vain, the second and third migrants were celebrated in the community for their achievements. Other community members, including our respondent, now look up to them and ask for advice, which correlates with a general sense of satisfaction and positive perceptions of habitability.

People in such positions can ultimately emerge as catalysts for positive change and possess the ability to gather others for collective action, given that "*people with higher social status are also helping the community at large, they can help to bring projects to the community, they can help set up public structures, or can contribute with help in the schools*" (PWJ4). Respondents were also praising people with high social status for their benevolence and small tokens of assistance, which served to invoke a sense of security and safety. The following view aptly illustrates the crucial patronage role for those that are less resilient: "*Sometimes you are not able to get more from your farm, but then you know that there are certain people in the community that you can go to and visit, and they have a high social status from migration, they can support you. If you do not have these people in the community, you are hopeless and have no one to turn to, then it is definitely worse for you*" (SSI26). Moreover, people with high social status can also contribute to environmental change adaptation. A fitting example is provided by a return migrant that has spent some time in Kumasi, where he learned the craft of rearing animals. Upon return, he used the acquired knowledge to build a rabbit farm, a means of diversifying the livelihood portfolio that was entirely unknown beforehand. Due to the continuous improvement of this migration-induced innovation, he is now regarded as one of the most successful farmers in the community. Accordingly, a migration-induced social status is deemed to be very beneficial for both those holding the position and those profiting from it and can improve subjective perceptions of habitability to a great extent.

Ultimately, social status is an important and culturally-embedded feature of social life in the community and can be bolstered – but also lowered – with migration. People that migrate successfully and build

something lasting can acquire a social status that will be highly cherished and admired, feeding into their subjective perceptions of habitability. Those that were longing for a similar social position were not necessarily envious, but rather emphasized that an increasing number of people with high social status will ultimately contribute to improve perceptions of habitability for the entire community: "*The success of migration is measured on what you have built in the village, and what has been done by the migrant in the community, for instance by establishing a business and building new houses. Migration is thus even increased in value by socio-cultural dimensions and rules in place*" (EI4). A prestigious social status was something that people were striving for, and positive examples served as motivation and stimulus to reach similar heights. Whilst this relation is indeed responsible for sparking additional migration flows, it also entails that both migration pathways and associated impacts are usually redirected to the community, born out of the ambition to demonstrate the success that has been achieved by prevailing in faraway places. A female participant embodied this tripartite desire of migrating, returning, and making a difference as she stated: "*I want to come back here and do not wish to make a completely permanent move (…). I want the place to develop here. You cannot just forget home. If I go and come back, I want to help build a clinic to leave a mark here. Maybe this will then also increase my social status*" (PWJ5). The fact that migration impacts a person's social status, and the high valorization that is given to such position in this specific socio-cultural context, can provide a range of beneficial effects for the community at large. Notwithstanding that the role of social status initially contributes to stimulate a reinforcement of migration flows, the locally-grounded and culturally-embedded relevancy of social status eventually also caters for the (re)direction of accruing benefits back towards the community, thereby implicitly enhancing subjective perceptions of habitability.

6 Discussion

The results of this study point towards an important role of the underlying socio-cultural context for subjective perceptions of habitability. In order to adequately assess the habitability of places, a reinforced consideration of both human perceptions and socio-cultural factors thus has to feature more prominently in corresponding research agendas. Migration impacts these socio-cultural contexts, either to negative or positive ends, (re)produces existing socio-cultural configurations, and thus contributes to shift subjective perceptions of habitability. Knowledge of these mechanisms is of vital importance for the design of adaptive strategies and overall migration governance whilst contributing to maintain a societies' desired level of cultural integrity in the process. We tally with Farbotko and Campbell (2022) in the opinion that only by including the perspectives, worldviews, and agendas of those at the forefront of experiencing local environmental changes, we can 1) come to understand which places are habitable for whom and under which conditions, and 2) can subsequently avoid the imposition of top-down and supposedly inappropriate responses, particularly with relation to migration management.

Existing research has shown that migration exerts unambiguous, and mostly negative, impacts on community cohesion, concomitant with a decrease of well-being and effects on subjective perceptions of habitability. An example from the Himalayan mountains similarly identified that out-migration entails the loss of a community's function as a resource for emotional comfort, security, and cultural knowledge (Upadhyay et al. 2023). Comparable to our results, migration was not only found to impact cohesion directly by invoking a loss of community members, but also though an increasing influx of negative behaviors upon migrant's eventual return in a study in Ghana and Burkina Faso (Sow et al. 2014). Hence, migration should not only be considered as potential panacea for adapting to declining levels of habitability, but also has to be assessed against the background of crumbling social support structures that play a crucial role for people's ability to respond to risks collectively. From a disaster risk reduction perspective, Bergstrand and Mayer (2020) found that communities with a high level of cohesion also share positive perceptions towards successful disaster recovery, which can be easily transferred to notions of habitability. In a similar vein, Smith et al. (2012) identified that the presence of a strong community-based identity is positively correlated to the perception of environmental risks and the willingness to resort to anticipative action. As such, community cohesion and therewith associated means of social interaction, communication, and support can be conceived as protective mechanism that serves to maintain both cultural integrity and resilience (Berkes and Ross 2013, Qin and Flint 2012, Brown and Westaway 2011). Particularly for strategies of migration governance, including resettlement, relocation, or promoting migration as strategy to offset declining habitability, prevailing levels of cohesion have to be acknowledged accordingly.

Strong sentiments of place attachment were intrinsically weaved into the underlying socio-cultural context and constituted an important marker for subjective perceptions of habitability in our study. Migration and the associated experiences of other places can contribute to alter existing place-based bonds (Gustafson 2001, Di Masso et al. 2019), whereby such impacts can resemble feelings of loss and grievance for both the actual migrants and those that are (in)voluntarily immobile. This notion is also emphasized by Tschakert and Tutu (2010) and Tschakert et al. (2013) in their application of the concept 'solastalgia' (Albrecht 2005). An environmentally-induced loss of endemic belonging is correlated with migration, whereby the "*longing for the distant home, the lost rural identity, and a place that provides true solace*" (Tschakert et al. 2013: 20) can affect residential satisfaction and thus interacts with subjective perceptions of habitability. On the other hand, negative perceptions of other places during migration can also lead to reconsider positive characteristics of the 'hometown', which was the case for many of our respondents. Such a revitalization of place attachment closely relates with a renewed investment in the community of origin and can entail beneficial effects for environmental change adaptation. For instance, studies in South Africa (Naumann and Greiner 2017, Njwambe et al. 2019), Tajikistan (Blondin 2021), and Namibia (Greiner 2010) show that well-pronounced levels of attachment correlate with a continuous investment in the home community, serving to improve subjective perceptions of habitability, and igniting future return ambitions. Moreover, studies in Northern Ghana (Goudaar et al. 2021) and in South Africa (Dlamini et al. 2021) found that respondents with high levels of attachment were more likely to perceive climate change and were more willing to engage in environmentally responsible behavior. Ultimately, people that showcase a high level of place-based pride and responsibility "*can act as catalysts to bring people together in collective action initiatives*" (Fresque-Baxter and Armitage 2012: 260), which underlines the reciprocal interrelation of place attachment, community cohesion, and social status. Given that many people aspire to stay in place, even when facing increasing environmental challenges, we have to account for the potential of migration to enable such attachment – just like we have to consider the potential pitfalls when proposing migration as blanket solution. A renewed focus on place attachment as important marker for subjective perceptions of habitability, and the potential of migration to shape this relation both positively and negatively, thus has to be included in future research, law, and policymaking.

Lastly, the high relevancy of a migration-induced social status in the community also mirrors findings in other studies in Ghana (Cassiman 2008, Schraven and Rademacher-Schulz 2015, Agyemang 2012, Sow et al. 2014, Jarawura and Smith 2015). Migrants can serve as self-propelling embodiment of a successful social status and are often referred to as '*big man*' (Cassiman 2008), which also pertains to comparable settings in Western (Alpes 2016) or Eastern Africa (Salazar 2010). Although this implies a stimulation of additional migration flows in a first instance, the culturally-embedded relevancy of social status also serves to redirect migration feedback effects, ignites renewed investments in the home community, and guides return aspirations. Complementing our results, this was also identified by Njwambe et al. (2019) in South Africa, where a migration-induced social status was positively correlated with the ability and aptitude to maintain the household, participate in rituals, and being eligible for marriage. In his research in Northern Ghana, Ungruhe (2010, 2011) identified the crucial role of return migration for younger generations as a means to show their success and claim their position in the community. And in the case study of Cassiman (2008) in Ghana, migrants were admired as the modern embodiment of the mythic nomadic hunter that 'goes to the bush', earmarked by a highly esteemed social position. However, and in line with the results of this study, many migrants also longed to exhibit this social position in their community of origin, based on profound feelings of attachment to the 'hometown'. In doing so, migrants actively contribute to refurbish social and material configurations in situ and thus (re)produce subjective perceptions of habitability that are rooted in the underlying socio-cultural context. The role of a migration-induced social status in this case study is thus allegorical for the socio-cultural peculiarities of local settings and serves to emphasize the relation between migration, socio-cultural context, and subjective perceptions of habitability.

Altogether, impacts of migration on the underlying socio-cultural context can serve to (re)produce socio-cultural configurations in situ and thus shift the subjective boundaries of perceived habitability on both individual and collective levels. The results from our study serve to emphasize the importance of taking subjective, human-centered, and culturally-sensitive approaches to habitability into account and call for more place-based research on the habitability-migration interrelation. Integrating the perspectives of

those communities at the forefront of environmental challenges greatly improves the integrity and practicality of habitability assessments and corresponding adaptive actions. Taking this relation seriously can thus facilitate the design, acceptance, and implementation of strategies aiming to improve local resilience whilst simultaneously enabling social groups to retain their desired level of cultural integrity.

7 Conclusion

This article has illustrated the potential of migration to (re)produce underlying socio-cultural configurations, which can contribute to shift culturally-embedded and subjective perceptions of habitability. Local manifestations of migration impacts can underpin commonly shared objectives for maintaining cultural integrity and feature back into collective responsibilities of adapting to environmental risks. The findings of this study can serve to further refine human-centered and perception-based frameworks of habitability that strive to identify how particular social groups conceive habitable places, a process that is based on subjective and culturally-embedded perceptions as much as it is based on bio-physical conditions. In doing so, we enable local communities to self-determine their level of agency and create a space for innovative strategies that are rooted in local understandings of the environment. Ultimately, bottom-up research on habitability and migration will be fundamental to provide well-tailored and context-sensitive migration governance approaches and serves to foster the design of adaptive strategies that not merely consider the respective local backgrounds on a superficial level, but much rather take interest in durable participation and sustainable outcomes.

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