A qualitative study of the migration-adaptation nexus to deal with environmental change in Tinghir and Tangier (Morocco)

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ABSTRACT
Over the last two decades, migration-as-adaptation discourses have theorized and studied how migration could facilitate adaptation to deal with the effects of adverse environmental change. However, contextual factors, such as migration trends and local social and economic contexts, as well as perceptions of this linkage have often been neglected. This study aims to understand how people perceive this relationship and whether and how migration, often in the form of remittances, is used for adaptation purposes. For this study, 48 semi-structured interviews were conducted with inhabitants of Tangier and Tinghir (Morocco). These regions are confronted differently by environmental change impacts. While both face increasing precipitation and temperature changes, Tinghir is additionally confronted with drought, desertification, water scarcity, and a growing number of more extreme weather events. Furthermore, both regions receive internal migrants and experienced significant emigration towards Europe. Results indicate that migration, as well as the sending of remittances, could produce a multitude of adaptation outcomes towards environmental change, resulting in an exacerbation of existing social vulnerabilities, alter economic development at the community level, and impact the development of alternative adaptation strategies, at both the individual/household and community levels. Findings demonstrate that migration-as-adaptation discourses must be considered within social, political, economic, and environmental contexts. These discourses should consider local migration histories and prevalent cultures of migration.

Introduction
Since the 1980s, activists and scholars have urged that more attention be paid to environmental/climate change as it would bring along mass displacement. Scholars such as Norman Myers (2005, p. 1), predicted that “when global warming takes hold, there could be as many as 200 million people overtaken by disruptions of monsoon systems and other rainfall regimes, by droughts of unprecedented severity and duration, and by sea-level rise and coastal flooding”. Inherent in these early discourses is that environmental migration is perceived as a failure, occurring when other mitigation and adaptation attempts do not succeed. Consequently, these migrants are seen as helpless
victims in need of international support and framed as a global security challenge (Felli 2013), impacting the development of migration policies (Bettini 2014). Gradually, the research focus shifted away from seeing climate/environmental change as a (deterministic) push factor for migration towards more complex understandings of how both relate to each other (Baldwin et al. 2014). With this changed focus, migration has increasingly been represented as a potential adaptation strategy to deal with environmental change (Smit and Wandel 2006; Gemenne 2010). In these migration-as-adaptation discourses, migration is seen as a means to reduce the vulnerabilities of social or biological systems (or both) to environmental change. Additionally, migration is expected to diminish risk inequalities by developing adaptation strategies that consider local organization structures, cultures, and environmental hazards and impacts, as well as the specific adaptive capacity (Smit and Wandel 2006). Lately, these migration-as-adaptation discourses have received some criticism as well for placing considerable responsibility on the actors involved to organize adaptation given the dominant neoliberal development ideas promoted by these discourses (Felli 2013; Bettini 2014; Bettini et al. 2017). These discourses also imply a more governed approach to migration and give high importance to solutions that place the full responsibility for developing community-wide adaptation strategies on affected populations without considering structural approaches (Felli 2013; Bettini 2014; Methmann and Oels 2015). Moreover, they insufficiently include contextual and organizational factors that turn migration into a potentially “successful” adaptation strategy (Bettini 2014; Hillman et al. 2015; Wiegel et al. 2019).

This study aims to examine how people living in specific highly-affected regions of environmental change view migration as an adaptation strategy themselves and how this relationship is embedded in a specific local social, political, environmental context. By departing from the local perceptions and evaluations of migration as a form of adaptation to environmental changes, insights can be gained in the (perceived) long-term adaptation effects of migration within a particular context. Hence, by understanding this relationship, based on locals’ perceptions, this study contributes to the debates on how migration could be seen as an adaptation strategy for dealing with environmental change. This study will focus on two regions in Morocco (i.e., Tangier and Tinghir). These two research settings are affected by slow-onset environmental change and have long migration histories resulting in diverging cultures of migration (De Haas 2006).

**Migration as an adaptation strategy?**

Migration as an adaptation strategy to deal with environmental changes became popular among policymakers and scholars as it provides useful tools by introducing resilience and adaptation in environmental migration policies (McLeman and Hunter 2010). Consequently, this approach reacts against earlier claims suggesting fear of potential “climate refugees”. Portraying migration as an adaptation strategy suggests that environmental migration could be an adaptation asset instead of a threat. This stance could entail more concrete policy actions that strengthen communities’ resilience and (potentially) contribute to adaptation to environmental change (Foresight: Migration and Global Environmental Change 2011; Asian Development Bank (ADB) 2012). These discourses give more agency to the people involved in dealing with environmental stressors (Black et al. 2011; Methmann and Oels 2015) and during migration decision-making processes
(Hunter et al. 2015). Finally, depicting migration as an adaptation strategy enlarges the research scope on environmental migration by including the (perceived) consequences of migration and alternatives to migration (Smit and Wandel 2006; McLeman and Smit 2006; Black et al. 2011).

There are various ways in which migration could serve as adaptation. Migration could be an adaptation strategy itself when emigration is from areas experiencing increased environmental change. Reception of remittances could also facilitate adaptation-in-place. Finally, migration could be seen as a last resort used when other adaptation strategies have failed (Gemenne 2010; Gemenne and Blocher 2017). Although migration in these discourses is seen as a potential adaptation strategy, its consequences are not necessarily positive (Juhola et al. 2016; Gemenne and Blocher 2017). This is even more difficult to assess due to the often vague and normative conceptualizations of adaptation strategies used in research and policies (Smit and Wandel 2006; Felli 2013). Such vagueness of conceptualization is even more pronounced when linking migration and environmental change (e.g., Gemenne 2010; Jarawura and Smith 2015). When wanting to evaluate what such successful adaptation strategies entail, scholars turn to assessments of whether an action reduces the damage caused by environmental change, which is often difficult to determine (Barnett and O’Neill 2013).

Building further on these discourses and critiques, this study’s contributions to the literature are threefold: it departs from local perceptions of migration and environmental change and understands how people link both together and further help to define adaptation; it focuses on contextual factors of regions affected by slow-onset environmental change; and it applies a multi-layered perspective.

First, this study is novel as it departs from the perceptions of affected populations to understand how migration possibly functions as an adaptation strategy for dealing with environmental change. Often, policies and research interpret adaptation strategies that focus on actual or expected changes and which vary from short-term coping strategies to long-term transformations (Moser and Ekstrom 2010). Such discourses overlook that people do not necessarily relate their migration projects to environmental changes (Howe et al. 2014; De Longueville et al. 2020). This results in a lack of understanding of the motivations to use migration as a potential adaptation strategy (Few et al. 2017). Ignoring such local knowledge and structures reinforces (post)colonial relations exactly through the implementation of these adaptation strategies (Ober and Sakdapolrak 2020).

Second, including such local perceptions is especially relevant when conducting research on facing slow-onset environmental changes (Hillman et al. 2015). Most studies concentrate on environmental migration patterns after massive destruction of a vulnerable region, such as cyclones or floods (Gemenne 2010) or focus solely on the climate-sensitive agricultural sector, which is highly dependent on technological development as well as on manual labour (e.g., Jha et al. 2018). Also, when departing from specific case studies and people’s perceptions of the relationship between environmental change and migration, this study aims also to include the importance of existing migration patterns and contexts (Van Praag and Timmerman 2019; Van Praag et al. 2021). The current study focuses on regions that already have long migration histories and experiences with the sending and receiving of remittances. In such settings, the interplay between migration dynamics and environmental change adds to a better understanding
on how migration interacts with other societal trends and responds to environmental changes.

Third, policies and research focusing on adaptation or resilience or both often lump together levels of analyses (Turhan et al. 2015) thus failing to distinguish between adaptation at the individual/household and community/national/international levels. This is a crucial distinction as many remittances are sent at the individual/household level, while adaptation strategies can be also located at the community level. At the individual/household level, migration could be an adaptation strategy as it increases the diversification of households’ incomes through the sending of financial remittances (Gemenne 2010). These are the financial flows sent from migrants to their friends and family in the regions of origin. Such remittances can become an adaptation strategy, but only when deployed to deal with environmental stressors (Leighton 20,109). This assumes that migration is planned as an adaptation strategy (Bettini and Gioli 2016; Wiegel et al. 2019) and that people have a shared understanding of environmental changes, discourses, and adaptation strategies (Van Praag et al. 2021). Financial remittances could be accompanied by an exchange of social remittances, including knowledge transfers, on climate change discourses but also local environmental changes. At the community, national, and international levels, migration could reduce demographic pressures on sustainable development, food security, and conflicts, and therefore increase the success rates of other adaptation strategies in the regions of origin (Gemenne 2010). Simultaneously, migration could distort the labour market or enable more people to remain living in a particular area (De Haas 2003). Nonetheless, in these discourses, the demographic pressures to destination areas, which are often larger urban areas located along coasts or rivers, are not taken into account. Looking at adaptation from a national/international perspective, this is also relevant as many of these migrants end up in the poorest neighbourhoods, creating additional vulnerabilities (Tacoli 2009; Gemenne and Blocher 2017).

**Methods**

In total, 48 qualitative interviews were conducted with people living in Tangier and Tinghir (Morocco). Theoretical sampling was used to structure the data collection based on previously-suggested regional and individual characteristics in research that are relevant when studying environmental migration (Glaser and Strauss 1967). Regions were selected based on, first, high immigration and emigration, and second, environmental changes in both regions. The migration history of these regions could matter for the development of climate change discourses and cultures of migration as well as to evaluate how migration is seen or used as an adaptation strategy. Two areas were selected in Morocco: Tinghir, located in the Todgha Valley in the High Atlas, and Tangier city, located in the Rif region (see Figure 1).

The municipality of Tinghir – located in the Drâa-Tafilalet region, south of the High Atlas and north of the Little Atlas Mountains – has a population of approximately 42,044 (RGPT (Recensement Général de la Population et de l’Habitat) 2014). This city has known a very large emigration towards European countries such as France and Belgium. Immigrants were actively recruited for manual labour in expanding sectors. This resulted in chain migration and established a culture of migration due to large local and
transnational networks established with people living abroad (De Haas 2003, 2006; Berriane et al. 2010). The city of Tinghir is built around a river oasis, with palm, olive, fig, pomegranate, almond, and other fruit trees, as well as (small) wheat and alfalfa fields in the Todgha basin. The local economy was initially based on self-sufficient subsistence agriculture. The region of Tinghir is highly impacted by precipitation and temperature changes leading to drought, desertification, water scarcity, and a growing number of more extreme weather events (Niang et al. 2014). This region has been confronted with struggles and wars over the control of water and land resources since the early 1900s and this has also shaped settlement patterns of ethnic groups (El Ghanjou and De Haas 2000).

Large flows of migrants in transit over a long period of time renders the city of Tangier an important site of investigation (Berriane et al. 2010). In 2014, approximately 94,7952 inhabitants lived in Tangier (RGPT (Recensement Général de la Population et de l’Habitat) 2014). This region is characterized by diversified economic activity. Recently there has been a strong political will to invest in local infrastructure, such as the extension of the port and road and rail networks. Tangier receives many migrants from the Rif area (Berriane et al. 2010) in particular. The region of Tangier has a Mediterranean climate, which also experiences precipitation and temperature changes. People moving from the Rif area are also feeling the impact of increased precipitation and drought (Niang et al. 2014). As it is hard to distinguish – from an individual perspective – the impacts of climate and environmental changes on one’s living environment, in this paper, no distinction will be made, referring to overall environmental changes.

At the participant level, the selected sampling criteria were: 1) access to migrant networks or migration experience; 2) gender; and, 3) socio-economic status. The first is important to fully understand the impact of migration in this region and across households. The latter two individual factors are important to include given the gendered migration norms and gender differences in vulnerabilities leading to environmental migration and migration outcomes (Chindarkar 2012) and the impact of migrant networks and remittances on the socio-economic status of households (Leighton 2009). Only respondents older than 18 years were interviewed. To recruit sufficient people with migrant networks, respondents were selected through connections of immigrants living in Europe. A second group of respondents was contacted during fieldwork in Morocco.

*Figure 1.* Fieldwork sites in Morocco. (Map retrieved and adjusted from Google Earth)
through associations, Facebook posts, by contacting people working in the tourism sector (e.g., people working as tourist guides or in hotels), for NGOs, and at local conferences. Interview appointments were made by WhatsApp or in person. Both informal and formal interviews were included. In total, 13 formal interviews, 3 informal interviews, and 2 expert interviews were conducted in Tangier (18 in total) and 24 formal interviews and 6 informal interviews in Tinghir (30 in total). Of the total 48 interviewees conducted, 21 were females and 27 males. Respondents’ ages ranged from 21 to 70 years old.

All interviews were transcribed and translated from the respective language in English by the author. The data analysis facilitating software Nvivo was used to structure, code, and analyse the data. A thematic approach was used to analyse the data and help to set up the conceptual framework. All names were replaced by pseudonyms to guarantee anonymity. As a female interviewer of Belgian descent, it was easier to reach male participants than female participants due to gendered task divisions and social interactions. Over the course of the fieldwork, special effort was made to reach female participants from a lower socio-economic background. Hence, during some interviews, an interpreter was used due to language issues, resulting in some potential translation biases.

**Results**

The consequences of both migration and environmental change are more pronounced in Tinghir compared to Tangier. This is mainly due to the different climatic and socio-economic conditions, particularly each city’s economy. Inhabitants of Tangier tend to working more in port-related sectors and the growing industry; its inhabitants were less confronted with environmental change due to the Mediterranean climate and urban lifestyle. Nonetheless, some people have migrated to Tangier to escape environmentally-degrading areas and economic hardships. For this group, migration could have been an adaptation strategy at the individual/household level to deal with environmental change. People in Tinghir rely more on agriculture and have been living in the environs of an oasis valley characterized by a long agricultural tradition. For this region, migration has impacted the adaptive capacity of the local population differently, as remittances and migration opportunities led to a varying reliance on agricultural production. Hence, the consequences of environmental changes such as drought, water stress, and extreme sudden weather events were not felt equally by all inhabitants.

**Migrant networks and remittances**

Despite the large sums of remittances sent by migrants to Morocco in general (Sørensen 2004), the receipt of remittances through migrant networks has shaped the communities in Tangier and Tinghir distinctly. In Tangier, remittances are used to support households for the provision of education or employment, as shown by Hasna and Sarah (33 and 38 years old, beauty salon owners, Tangier), who used money sent by their brother in Belgium to start up their business. Or for Sami (21 years old, Tangier), who stated that relatives in Europe made him more eager to work “and gain a lot of money in Europe”. Zakaria (67 years old, tourist guide, Tangier) describes how people go to cities and Europe
to work and leave their land in mountain regions like the Rif area behind them, “drying”, sending their relatives money to earn a living:

Zakaria: “Some [people set up projects] when they have a lot of money, they keep half [of the money] for the project and half [of the money] to live with. Some of them, they just send money, just to live, to pay the rent, light, water, clothes, or shoes. If you are not ‘down there’ in the Rif, and if someone sends you money, for your son, for your daughter, you just keep it”.

In the literature on migration as an adaptation strategy, the use of remittances is often cited as an argument in which migration could, through the sending of remittances, also contribute (partly) to adaptation strategies dealing with environmental change. However, as shown by Zakaria’s account, most remittances are not used to invest in environmental community projects. Rather, they reduce individual hardship and secure households’ livelihoods. Similarly, in Tinghir, Moroccan migration networks established in Europe after World War II (De Haas 2003) resulted in a significant flow of remittances to their regions of origin and impacted all life spheres of these local communities (e.g., construction, local economy, health, transport, and education):

Jamal (40-year-old male journalist, Tinghir) “Tinghir has evolved, thanks to the migration, not due to the authorities neither to the elected ones, nor to the services, the state, nothing of these. If not for emigration, Tinghir could not have come like that, big buildings, cars all everywhere”.

Jamal continues that “almost every family has family in France” or Europe, and for those who don’t, there exists some form of solidarity economy (especially between families). This also shows that remittances lay at the basis of existing and widening inequalities in societies, as some families can more easily access additional money in times of need, while other families have to rely on solidarity initiatives. In practice, these solidarity initiatives usually cover only the most urgent matters and are very variable in the support they offer; they certainly do not compensate for the insecure livelihoods and lack of welfare system, but are often decentralized, grassroots-based projects providing irregular support. Although most remittances are used to cover daily expenses, they sometimes also cover small-scale investments in agriculture for locals who continue to work on their fields in the oasis valley of Tinghir. These investments include the construction of water wells, installation of solar panels or diesel pumps, and maintenance of water canals in the farmer’s parcel. Similar practices are found in the entire region:

Loubna (25-year-old female student in Istanbul, Turkey, visiting region of origin, Ouarzazate Morocco) “For example, if they know that, for a certain time, they will not have water, they will just make some wells, so that they get some money, some loans or they get some money from their family, to ensure they will have enough water [to water the crops], even if it doesn’t rain”.

These remittances are often too small and provided on an occasional basis, for instance only on Ramadan (Sørensen 2004), to structurally invest in environmental adaptation. Nonetheless, some small improvements can be made, but do not counter the degrading environment or transform local society. Importantly, those groups who still wish or need to invest in agriculture and complement their incomes with agricultural activities are
mainly those who do not have migrant networks. This makes them even more vulnerable to environmental changes and economic hardship.

**Adaptation strategies at the individual/household level**

In both regions, previous migration networks and remittances lead to more migration opportunities, career changes, and the abandonment of agriculture (De Haas 2006; Berriane et al. 2010). Remittances are invested in initiatives dealing with the degrading environment when they immediately impact individual/household livelihoods. However, due the small contributions sent, most of these investments do not necessarily benefit the entire community in dealing with environmental change, as Loubna states: “They try to find solutions to the problem [climate change], just to survive. Because they are not powerful enough to do something which will stop this climate change”. This means that one could, for instance, invest in a water well to secure their water availability, which increases water shortage in their surroundings. In Tangier, most respondents who migrated when facing increasing environmental stressors and economic hardships sought better employment opportunities. Respondents frequently dissociate themselves from rural areas and activities, depicting these as something of the past:

Hasna (33-year-old female beauty specialist, Tangier) “The reasons we came here [Tangier] is that, before our father died, he decided to come and live here, as we were living in a small village where there was nothing to do, there was no work, and there were no big companies. It was a village, where there was only agronomy, there was only agriculture. Finally, to have a bright future, we decided to move to Tangier”.

Initial migration motivations are gradually transformed over the course of people’s migration trajectory. In the end, most people remember only the quest for paid employment and mountain regions’ lack of development and investments as drivers for migration, not linking their migration to environmental change. Additionally, they hardly refer to alternatives they had rejected before migrating. Moreover, dealing with stressors such as drought is seen as a way of life that characterizes the region, as illustrated by Wadil (31-year-old male teacher, Tangier): “My grandparents started their life in ‘the drought’ (…) Muslims know how to live like that”. This complicates the development of future investments in adaptation efforts as drought is not perceived as a novelty. Traditional drought adaptation methods – such as digging water canals and communal laws on water usage – existed before people became aware of climate changes. This complicates awareness of the aggravating impacts of climate changes in Morocco.

In Tinghir, a wider variety of adaptation strategies at the individual/household level are perceived and applied. However, the input of migration networks and remittances rather disconnects environmental changes from people’s everyday lives. As remittances are sent based on the actual needs of relatives, the ones with migrant networks no longer “need” to invest in the natural environment or agriculture due to the cumulative advantages migration has brought their households. This trend to move away and disconnect from agricultural production is visible when looking at the popularity of migration to larger cities and enrolment of young people in careers focusing on cooking, administration:
Chafik (64-year-old male hotel owner, Tinghir) “It’s the rich who do that [making wells with a pump]. The rich who have land [do that], but [the fields of] the poor: everything is dry”.

Interviewer: “What do they do?”

Chafik: “Nothing. Now, many people leave the palm grove abandoned because it doesn’t provide anything. You have to do business, there are people who go in vegetables, there are people who do business, clothes … we leave. Not many people work now in the palm grove. Because there is no water”.

As shown by Chafik’s quote, wealthier people are able to invest in agriculture. Poorer individuals and households – with no access to migrant networks – are more limited to seeking work elsewhere or using outdated equipment on “dry grounds that are left behind”, without any prospect of future innovations. Some work in their fields of neighbours or emigrant families. For instance, Nour (45-year-old female head of an association for women’s development, Tinghir) refers to the fact that people originating from Tinghir started to work in administration or migrated, and that mainly people from elsewhere work in agriculture to provide food for donkeys and other animals. Because of the lack of agricultural investment, only small innovations are made, such as changing crops or cultivation methods. If modernization is not possible, people move elsewhere – as attested by Mamoun and Mouhcine (two male bartenders, approx. 30 and 33 years old, Tinghir):

Interviewer: “And what do people do to adapt?”

Mouhcine: “They are obliged … they are obliged to …”

Mamoun: “People migrate. There are people who try to adapt, that’s it, and with an idea on their own, they make an effort, agriculture, because we do not have great fields. It’s just a small field like that, helps economically to live and to survive, only. It’s not a business agriculture. It’s just subsistence farming, just to live and eat (…) They apply new irrigation techniques, like drip irrigation, a modern irrigation technique to conserve water as water is scarce here (…) Before, there were canals that spill a lot of water in the fields, so they do not serve much in agriculture. Only peasants do that, so it’s limited. Most of them are ‘seekers’, most of them do not spend their time, they don’t waste their time doing things like that, they are moving to Europe or to big cities”.

Agriculture is certainly not seen as an interesting future investment by many (young) people. Currently, the main agricultural activity in Tinghir consists of food production for animals or to supplement one’s income when it is not sufficient to maintain an entire family nor buy other products (e.g., smartphones, medicines, etc.) that allow a modern standard of living. For instance, Safa (24-year-old female administration student, Tinghir) stated that they used to have a cow and still have fields but “we do not sell it, it’s like pfff … we just left it. We don’t work on it anymore”. Sometimes Safa’s neighbours work their fields mainly to grow animal feed. This disinterest in agriculture seems to go hand in hand with Safa’s desire to move abroad, if possible “to America”. Reflecting Safa’s account, high emigration rates, the advantages of migrant networks, and the lack of agricultural innovation makes migration even more appealing to secure a future. This reduces the development of alternative adaptation strategies for dealing with environmental issues.
Similarly, older generations hold mainly migration aspirations for their children, as expressed by Houda (51-year-old widow, Tinghir) and Rehana (46-year-old housewife, interviewed with interpreter, Tinghir):

Houda: “My children want to go to Europe, but I am not sure whether they will have the opportunity to do so. It’s difficult to get there”.

Interviewer: “Why do they want to go here?”

Houda: “To Europe? To change their lives, to search a lot of money, because when you work abroad, you can gain more money when you work”.

Interviewer: “Are there a lot of employment opportunities here in Tinghir?”

Houda: “No, if you work here, you won’t make a lot of money and on top of that, there aren’t enough employment opportunities in Tinghir”.

Rehana (Interpreter): “All [7] children are here, apart from … did you encounter Chakir [son]? He migrated. His dad told him to go, in order to support the family. He said you should go out and do it yourself, leave the house and work! He left for Libya, stayed a year and returned with zero dirham [local currency]. Now, he works here, like everyone, in construction”.

These accounts demonstrate that in Tinghir, younger generations aspire to migrate due to the lack of interesting employment opportunities that adequately reward them for their work – certainly not in agriculture. The sector faces increasing difficulties due to environmental degradations such as water scarcity, more extreme weather events, but also from societal changes such as a lack of investments and changing standards of living. Consequently, the existing cultures of migration that have been established through feedback mechanisms over the last decades and rewards received from migration fuel individuals’ or households’ development of migration aspirations rather than investments in agriculture.

Adaptation strategies at the community level

The development of adaptation strategies needs to be discussed at the community level since many adaptive innovations require such an approach. This is especially the case in Tinghir, given the communal systems of water management and land heritage rules. Thus, a community-wide approach is needed in the entire oasis valley to develop context-specific and innovative adaptation strategies. These include reconsideration of the construction and cleaning of water canals and renegotiation of existing rules concerning water usage for limited periods per parcel. Additionally, it requires a revision of the land heritage system under which land is passed to the next generation but cannot be sold, leading to tract fragmentation and uncultivated land. It seems that investing in agricultural activities within this specific oasis valley becomes more appealing when structural reforms are being made. The ongoing migration dynamics contribute to community-wide adaptation to environmental change. At this moment, migration dynamics and remittances have impacted such development in two different ways, not necessarily focusing on environmental adaptation. This depends on access to land, migrant networks, and remittances. The first approach results from the impact of migration dynamics on the
varying dependence on and access to land – which also matters for future investments in agricultural activities and adaptation strategies. This largely hindered development or led to a lack of stimuli to form community initiatives for environmental adaptation. This does not, however, mean that no initiatives were undertaken. During the fieldwork, migrant remittances occasionally led to the development of community-wide projects dealing with environmental change within its wider societal context.

Remittances and community development

Migration – particularly through the sending of remittances – does not contribute to environmental adaptation, certainly not at the community level. Nonetheless, these monetary and knowledge flows have shaped Moroccan cities and life substantially (Sørensen 2004; De Haas 2006). Especially in Tinghir, people do not seem to investment in agricultural innovations; remittances are used for individual and household ambitions and survival and therefore further widen inequalities between those with and without migrant networks. This gap partially reflects those who must still rely on their natural environment (through agriculture) and those who don’t. The unequal competition between households due to access to migrant networks and remittances distorts the local economy and devalues the importance of agricultural activities and investment therein. This cyclic devaluing process of agricultural activities is nourished by migration dynamics that started eight decades ago (De Haas 2003). These processes also limit the development of collective adaptation strategies dealing with environmental change. Agricultural fields have been left to those without migrant networks and with no alternative means to earn an income. It is also hard to attract investors, as local heritage systems prevent land from being sold, thus leaving some tracts to degrade. Despite the large numbers of degraded land, there is still a small but significant number of households without land that still desire access to fields as they are having a hard time making ends meet.

Remittances used for environmental adaptation

In Morocco, big investment projects regarding water management such as dam construction or energy production (e.g., the Noor solar plant in Ouarzazate) are very much centralized or funded by foreign development institutions, or both. (Bentaleb 2015). Despite extensive federal involvement in such large projects, all other support is expected to derive from bottom-up activities, consisting of people setting up small associations – often funded through remittances. This places a great burden on community-level projects which must compensate for of the lack of a welfare system and thus must deal with a range of needs, such as taking care of people with disabilities, disposing of waste, planting trees in school areas, or small agricultural projects. This is the case for Malak (a 40-year old female with a physical disability and head of various one-person associations, Ouarzazate) who “has been working on the alphabetization of women for four years now, in order to teach them how to read and write, understand the journal at the television, and to understand Arabic”. Remittances are rarely used to invest in structural organizational, logistic, and technological investments in agriculture or to reduce the harmful effects of drought and desertification at the community level. Reflecting on the use of
remittances through the interviews, remittances are not used to invest (collectively) in adaptation to environmental change. This means that the premise of migration-as-adaptation discourses is not applicable here. Moreover, the opposite effects occur, as recipients of remittances tend to invest less in adaptation to environmental change due to their lowered dependence on agricultural activities and reduced interest in maintaining self-subsistence agriculture in a degrading natural environment.

The fieldwork in Tinghir highlighted an example in which migration was actively used by local and transnational actors to set up small-scale neighbourhood projects focused on environmental adaptation (amongst other objectives). Founded in 2006, Project X used financial and social remittances sent by transnational migrant network members and migrant organizations to prevent youth migration, diversify household incomes, provide local employment opportunities, and develop innovative technologies dealing with environmental degradation. The project is led by a government official – a geographer by training, who has extensive networks in France and Catalonia (Spain). Through informal contacts and frequent visits to Tinghir, these emigrants started to develop the idea to deal with adverse environmental changes, sharing and discussing climate change discourses and observations, thus proving the value of social remittances. Their shared knowledge and discussions was bolstered by financial remittances raised through projects set up in European countries by migrants and their local networks with the aim of investing in their region of origin.

Through Project X, all neighbours could benefit from this project and claim a parcel to cultivate. The project sidesteps traditional hereditary territory rights – which are not for sale and prevent large-scale investments – by moving its parcels outside the fertile and abandoned oasis valley to drier and less fertile areas. Furthermore, Project X enabled the use of new technologies that require larger parcels and investment in other crops. This allows project participants to move away from a self-subsistence economy by investing in date palms that provide a higher quality of dates (i.e., El Mahjoul) that can be sold. All parcels collaborate in water management by constructing an irrigation basin with new water pipes and a hydraulic dam. They started to pump ground water with an irrigation pump powered by solar panels and developed a synthetic terrain. Finally, in each personal lot, date palms are planted, and zones linked with a drip system.

Discussion

This study aimed to gain a better understanding of how migration – especially through financial and social remittances – leads to adaptation to environmental change by using a multi-layered approach based on empirical data from two case studies in Morocco. These analyses demonstrate that migration cannot be seen in a straightforward way as the one and only – and successful – adaptation strategy dealing environmental change within this context. Rather, migration is one of the various potential ways to deal with environmental change and its adverse impacts on their lives (McLeman and Hunter 2010). However, the analyses of this empirical study reveal that few respondents actually frame their migration projects in terms of adaptation to environmental change. Instead, other drivers of migration were highlighted that should be understood in the overall transformational processes and changes characterizing local contexts within the Moroccan society. Therefore, when evaluating migration as an adaptation strategy in these
Moroccan case studies, this relationship is hardly approached and framed as such at the individual/household level. This is an important finding as migration-as-adaptation discourses too easily assume that migration projects are planned proactively/reactively to reduce vulnerabilities to climate change (cf. IPCC 2014), to help their communities of origin and family members that did not migrate (Bettini and Gioli 2016; Wiegel et al. 2019). Hence, people should be knowledgeable of ongoing and projected environmental changes, discourses, and available adaptation strategies. This is an important caveat as financial remittances are often sent to individuals/households and thus hard for policymakers to grasp their impact (Kapur 2005).

When connecting migration and adaptation at a community level, this can result in various co-existing initiatives that stimulate resilience towards environmental change, also impacting the individual level (Bettini 2014). While in theory there are different ways in which migration flows and the sending/exchanging of social and financial remittances could contribute to the adaptation of environmental changes (Gemene 2010), this is far harder to realize in practice. Nevertheless, Project X provided an example of how migration could contribute to the development and realization of adaptation strategies. Spurred by financial and social remittances from emigrants, innovations necessary for generating more revenue could be introduced such as creating larger land parcels that facilitate the use of mechanical assistance such as tractors and introducing newly-developed technologies and crop varieties. This project demonstrates social remittances accompanying financial flows add value when developing adaptation strategies as this leads to the exchange of both local knowledge and climate change discourses. Nevertheless, it is hard to fully assess the adaptive value of Project X, especially since it is in its starting phase and because assessing “successful” adaptation remains hard to evaluate due to its normative character.

Future research should study and assess the outcomes of all migration-related matters per specific context to fully assess whether and how migration functions as an adaptation strategy. Migrant networks and remittances are, at the individual/household level, frequently used to reduce people’s dependence on agriculture (De Longueville et al. 2020). At the community level, migrant networks and remittances diminished the total number of households that are dependent on agricultural activities but created a dependence on remittances for buying necessities and goods, such as decent medical treatments. Additionally, due to the lack of governmental protection against environmental change and the absence of a well-developed welfare system, migration seemed to increase the vulnerabilities of households without migrant networks. This might also reduce communities’ overall investments and adaptive capacity with regard to agriculture. These results indicate that the multiple ways in which migration is evaluated and perceived as an adaptation strategy to deal with environmental change needs further consideration (Jarawura and Smith 2015; Wiegel et al. 2019). The emergence of discourses that propose migration as an adaptation strategy could benefit from the inclusion of contextual factors (Bettini 2014; Hillman et al. 2015; Wiegel et al. 2019) and migration dynamics (Van Praag and Timmerman 2019; Van Praag et al. 2021).

Policies could benefit from a differentiated approach towards adaptation strategies within communities to make a more precise evaluation of the needs and vulnerabilities of the local population. Furthermore, it could help to map out the barriers towards a successful implementation of developed adaptation strategies (Biesbroek et al. 2013).
Local knowledge and structures need to be taken into account to develop adaptation plans dealing with the joint impact of environmental and other societal changes (Ober and Sakdapolrak 2020). Additionally, a more critical stance should be taken to migration-as-adaptation discourses that assume individually-sent remittances will provide solutions for dealing with complex and community-wide environmental issues (Kapur 2005). Future policies should redirect responsibility for environmental adaptation from affected populations and (vulnerable) migrant groups to governmental bodies and strive for more structural approaches (Felli 2013; Bettini 2014). Furthermore, greater attention should be paid to how adaptation processes impact existing social and ethnic inequalities (McLeman and Gemenne 2018) and those who do not have or have limited access to migrant networks and remittances across households, groups, regions, and countries.

Conclusion

The results of this study demonstrate that there are different ways and levels in which migration relates to adaptation. At the individual/household level, local inhabitants of both Tangier and Tinghir do not actively develop adaptation strategies for the changing natural and socio-economic environment. This would require changing the system, larger structures, and bigger financial flows. Because of the difficulties to realize this at the individual/household level, migration is an attractive solution for coping with the degrading natural environment, lack of agricultural investment, and changing living standards. At this level of analysis, migration is mainly a way to reduce individual vulnerabilities to environmental change and secure one’s livelihood. These migration aspirations are easier to realize for those coming from higher socio-economic classes and those with migrant networks. Nonetheless, the data suggest that it does not necessarily contribute to investments in (long-term) adaptation strategies for people left behind. Individual small-scale adaptation strategies are in some cases developed – chiefly, switching crops, building wells, and installing irrigation techniques – but they do not structurally change the degrading natural environment. At the community level, due to long-term impacts of previous migration waves, migration often is not a consciously-developed adaptation strategy to deal with environmental change nor does it contribute on a larger scale to the actual development of other adaptation strategies. Instead, environmental change makes migration even more attractive, leading to a cyclic process in which people will consider migration as the most appealing solution to secure a bright future and decreasing efforts are made to invest in agricultural activities. Interestingly, some community projects, such as Project X, have the potential to translate the assets of migration such as knowledge exchange and the sending of financial remittances into a valuable adaptation strategy for dealing with a slowly changing natural environment.

Acknowledgments

This work was supported by BELSPO under the Brain.be programme under Grant Agreement number BR/175/A4/MIGRADAPT (Acronym: MIGRADAPT)
Disclosure statement

No potential conflict of interest was reported by the author.

Funding

This work was supported by the BELSPO [BR/175/A4/MIGRADAPT].

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