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The role of environmental factors and other migration drivers from the perspective of Moroccan and Congolese migrants in Belgium



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Abstract

This manuscript describes findings from 53 interviews conducted with Moroccan and migrants from The Democratic Republique of the Congo living in Belgium, with an emphasis on discussing the extent to which environmental factors in the migrants' home countries may or may not have influenced their migration decisions. A comparative approach clarifies and disentangles the relationship between natural environmental factors and other drivers of migration in two distinct contexts. Applying a comparative approach and having extensive biographical accounts of each interviewee's migration trajectory and history enables us to understand how individual migration aspirations develop gradually and how the importance of environmental factors changes during different stages. Conceiving of migration as a multi-stage process, this study demonstrates how environmental factors are closely linked to other factors and play different roles during a migration trajectory.

Keywords: Environmental change, Migration trajectory, Multi-stage process, Drivers of migration, Biographical approach

Introduction

The relationship between environmental change and migration is currently attracting substantial interest in academic research, as well as in the public debate (Black et al., 2017; McLeman & Gemenne, 2018; Nawrotzki & Bakhtsiyarava, 2017; Wiegel et al., 2019). While sudden and gradual environmental changes have always caused different forms of displacement around the world, growing concerns about the increasing impacts of environmental change on migration are driving much of the current research. However, since migration is driven by many factors, it can rarely be reduced to the effects of just one form of change, such as climate change or other environmental factors (Castles et al., 2013). Unsurprisingly, previous studies (e.g., McLeman et al., 2017; Gemenne, 2011; Beine and Jeusette, 2018; Maystadt, 2012) evaluating the relationship between environmental change and migration yield inconsistent results. This could be due to the interrelation of environmental factors with other migration drivers, but also to a lack of



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reliable global data, and to difficulties in defining what constitutes environmental migration (Bates, 2002). Environmental change research and migration studies have also portrayed environmental migration as a multi-stage (or even as an open-ended) process, which includes both domestic and international migration processes. Yet, we have little knowledge of the varied roles environmental change can play in the different stages of the migration process. Therefore, this article aims to disentangle "migration" into different parts of (multi-step) trajectories to study how migrants' perceptions of the role of environmental change are evolving or changing. Doing so, we highlight how migrants' assessment of environmental change is influenced by the migration trajectory, discourses and networks.

Both the Moroccan and migrant groups from The Democratic Republique of the Congo have a relatively long migration history with Belgium, which has resulted in wellestablished migrant networks that send significant remittances to their regions of origin (Isaakyan & Triandafyllidou, 2017). The migration trajectories of these groups have already been studied several times (e.g. De Haas, 2014; Schoonvaere, 2010)). Until now, however, environmental factors have not been included as a possible factor of migration. Therefore, we investigate how both groups have experienced environmental change influencing their daily life, livelihood and migration decisions. By taking a biographical approach we aim to deepen our insight into the changing entanglement of environmental change and different drivers of migration.

Migration history, trajectories and environmental change

Environmental change affects society by exacerbating existing problems and inequalities. This is also true for migration: environmental factors influence migration trajectories as a 'threat multiplier', meaning they put pressure on other factors that give rise to migration (e.g. economic downturns, political crises) (Black et al., 2017; McLeman & Gemenne, 2018). To study the gradual development of migration decision-making processes and to appraise the role that environmental changes play therein we will focus retrospectively on migration aspirations and migration trajectories (Van Praag et al., 2020; Wiegel et al., 2019). Therefore, biographical-narrative interviews are important to give voice to these often highly vulnerable groups in both their immigrant country and their country of origin, and to be able to systematically study the prolonged and possibly multi-stage nature of the migration trajectories. For many migrants, their destination is not pre-determined and can be influenced many times during their journey, depending on the varying difficulties with which they are confronted (Collyer, 2010; Belloni, 2019). The multi-stage approach to migration was first identified at the end of the nineteenth century (Ravenstein, 1885). Stepwise migration is defined as a process in which individuals or families enter a migratory path that takes them gradually, through intermediate steps, to a final destination. When we relate this to international migration, the assumption has often been that migrants first move within their own country to an urban environment where the likelihood of them emigrating abroad increases significantly, with a departure abroad as only the final "step" in their migration life path (Brown & Sierra, 1994). In this study 24 of the 30 Moroccan migrants have not migrated to Belgium directly from their region of origin. This was also the case for 11 of the 23 respondents of The Democratic Republique of the Congo. These multi-stage and lengthy migration pathways faced by migrants undermine our understanding of migration as a transition from the place of origin to a new place and require us to pay more attention to the journey itself. A view of migration as a multi-stage process thus provides a better understanding of how domestic and international migration processes are linked. In addition, it allows us to demonstrate how different factors interact and influence the migration decision process, while people on the move do not have a comprehensive view of their entire migration trajectory and find it hard to immediately categorize their migration trajectories (Collyer, 2007). Finally, we can thereby also ascertain to what extent the causal factors for each successive move are influenced by the causal reasons for former ones, or if each successive move is largely independent from preceding ones.

In addition, the existing theory "new economy of labor migration" (NELM) is also an important conceptual improvement in migration theory. This approach focuses on the idea that the household, and not the individual, should be considered as the unit where decisions about migration are made (McLeman & Gemenne, 2018). It was mainly Stark (1978; Stark & Taylor, 1991) who changed the idea around migration by placing the behavior of individual migrants in a broader social context and by considering not the individual, but the family or household as the most appropriate decision-making unit. By integrating this new approach into migration studies, other factors than the maximization of individual utility are considered to influence migration decision-making (De Haas, 2007). This also means that the departure of a household member does not necessarily have to result in an absolute increase in income, but could also make sense as a collective risk-spreading strategy. Particularly, the assumption here is that households and families act not only to maximize income, but also to minimize and spread risks. Internal and international migration can then be viewed in this way as a household response to reduce income risk, as remittances sent by migrants can be viewed as income insurance for the households of origin. While remittances are thus ignored in neoclassical migration theory, within the NELM they are considered one of the most essential motives to migrate (De Haas, 2007).

A comparative approach to environmental migration to Belgium

We take a comparative approach to study how environmental changes are intertwined with other country- and region-specific factors and other drivers of migration. Previous case studies have demonstrated the importance of considering the regional interplay between environmental and other migration reasons, but do not take a comparative approach that further clarifies and disentangles the relationship between environmental factors for different migrant groups (Alscher, 2011; Kartiki, 2011; Shen & Gemenne, 2011; van der Land et al., 2018; Veronis et al., 2018). Furthermore, many comparative studies do not start from the perspective of migrants themselves (e.g., Bertoli et al., 2020; Hunter et al., 2015; Ruyssen et al., 2014). Instead, they document heterogeneous mobility responses to weather shocks.

In the present study, we focus on migrants living in the same immigration country, namely Belgium. Our analysis starts from the perspective of both Moroccan migrants and migrants from The Democratic Republique of the Congo. The choice of migrants coming from these two countries of origin is interesting since they are both more traditional migrant groups in Belgium. However, the two groups have a different migration

and colonial history in relation to Belgium. Moroccans were actively recruited to come to Belgium as labor migrants after the Second World War (and later came through family reunification) (Alders, 2005). Migrants from The Democratic Republique of the Congo arrived in Belgium mainly as educational migrants, whose journey was facilitated through programs and ties built up between DRC and Belgium, due to their colonial history (Viaene et al., 2009). The migration processes of these two groups have already been studied several times in Belgium (Reniers, 1999; Swyngedouw et al., 2009; Timmerman et al., 2017; Viaene et al., 2009). However, up to now, no research has been done on the potential role of environmental factors when dissecting the migration trajectories of these two groups present in Belgium.

Research context, data and methodology

We chose two migration groups living in areas affected by slow-onset environmental changes. Africa is one of the continents most affected by climate change, where domestic economics largely rely on climate-sensitive livelihood activities (WMO, 2020). Morocco is geographically located in a region at risk of global change (IPCC, 2014; Khattabi et al., 2014; Nouaceur & Murărescu, 2016). Over the past 30 years, it has undergone various changes in the annual climate cycle that are particularly visible in the precipitation rates, average temperature levels, drought periods, and occurrence of extreme events (Benassi, 2008; Driouech et al., 2010; Khattabi et al., 2014). These changes have resulted in desertification and growing aridity (Schilling et al., 2012). As in other Mediterranean areas, groundwater in coastal areas is vulnerable to salinization, due to rising seawater levels related to global change, and events of extreme drought when rivers then carry insufficient fresh water towards the sea (El Yaouti et al., 2009). The Democratic Republique of the Congo is particularly known for its political conflicts and economic issues (Flahaux & Schoumaker, 2016), but it also faces environmental disruptions which, in combination with socio-political crisis, are having a strong influence on human mobility. More specifically, many provinces are affected by earthquakes, mudslides, landslides and volcanic eruptions that affect populations and the environment and can result in displacement of populations (IOM, 2013). In addition, in DR Congo, there has been considerable migration from rural to urban areas in recent decades, which resulted in increased degradation of natural resources (forests, crop lands). This in combination with poorly managed urbanization, overcrowding, and informal settlements, more people have been exposed to risks and the potential negative effects of environmental changes (Michellier et al., 2020; Van Praag et al., 2021).

A biographical approach

The use of biographical-narrative interviews offers a way of empirically capturing the diversity, complexity, and transformational character of migration phenomena. In addition, the embeddedness of gender and migration as well as generational relations becomes visible through the biographical perspective (Apitzsch & Siouti, 2007). The principle of the biographical approach is that migration is an action in time. As a result, no movement can be seen as an isolated event (Ní Laoire, 2008). Migration decisions can therefore be understood as an important part of long-term biography, linked to all the other transitions and decisions that occur during life. A useful starting point for

exploring biographical approaches is, obviously, the focus on individual biographies, as the causes of migration can be found in the life cycle of the individual and not just in an external trigger event (Findlay & Li, 1997). A biographical perspective allows the respondent to explain how he or she has experienced transitions during his or her life-course. It is hence based on the recognition of individuals as pro-active, socially embedded, intentional agents who influence and are influenced by the social worlds in which they are placed (e.g., Halfacree and Boyle (1993)).

Data collection

Qualitative research methods, namely a biographical approach, enabled us to study systematically the long and fragmentary nature of these migration trajectories (Findlay & Li, 1997). The main idea of the biographical-narrative interview is to generate a spontaneous autobiographical narrative (Apitzsch & Siouti, 2007). By enabling migrants to tell their own stories and creating a context in which they felt comfortable exploring their feelings and experiences, we were able to learn more about those aspects of their lives which crucially affected their migration decision-making process. During the data collection, respondents were asked to talk about the most important aspects guiding their migration decisions and to present these in whatever ways seemed most fitting to them. This approach improved validity by allowing participants to pattern the timing, sequence and context of topics discussed (Elliot, 2006). Examples of questions that were asked to help respondents tell their story were the following: What memories do you have of your childhood? What memories do you have of your region and country of origin? What was your daily life like in your region of origin? To what extent were you dependent on nature or environmental factors? What things did you stress or worry about? Where have you lived throughout your life and for what reasons did you move? What did your migration path look like? The memories that emerge and the way the respondent speaks about them, give us more insight into events which have remained in the person's mind and are therefore meaningful.

Research sample

The first author conducted 53 in-depth interviews in Belgium between May 2019 and January 2020, with Moroccans migrants and migrants from The Democratic Republique of the Congo living in Antwerp and Brussels. The two countries were selected based on two factors: (1) large migrant populations living in Belgium (in absolute terms); (2) impacted by environmental/climate changes (BISA, 2018; Buurtmonitor, 2019; Bousetta et al., 2002). In each research setting, we attempted to recruit a diverse sample in terms of age, gender, occupation/livelihood, social status, and personal migration history. To realize this purposive sample variation, some recruitment strategies were adjusted over the course of the fieldwork, for example, to recruit certain age groups and have sufficient variation in our sample. Taking a qualitative approach, in which we contrast the findings of these two countries, we aim to study similarities and variations across different socio-environmental contexts.

For the recruitment we made a number of field contacts to reach the respondents through non-profit organizations and individual entries (e.g., regional offices in Antwerp (Atlas) and Brussels from the integration agency, umbrella organizations, such as the Federation of socio-cultural associations of people with a migration background (FMDO) and Federation Moroccan Association (FMV). We also worked with the snowball method, whereby the respondents who have already been recruited, were asked to apply other respondents. In total, 30 interviews with migrants from Morocco (14 women; 16 men) and 23 with migrants from DR Congo (10 women; 13 men) were conducted and analyzed systematically. When comparing the sociodemographic background characteristics of the Moroccan and Congolese sample, the main differences relate to the level of education and age. This is mainly because many of the Congolese respondents came to Belgium with a study visa (Portes & Fernández-Kelly, 2015), mostly, in our sample, to study economics. This could explain why we were able to interview more people in the age-range 20–30 in the Congolese target group, which is important when interpreting the results. Half of the Moroccan sample consisted of respondents aged 40–50. Moreover, a larger proportion of the Moroccan respondents had already lived in Belgium for a longer period of time than the Congolese sample (Table 1).

Analysis

All interviews were transcribed and translated from Dutch, French and Arabic into English by the first author. All names were replaced by pseudonyms to maintain the respondents' anonymity. The data analysis-facilitating software Nvivo12 was used by

Age	Moroccans	Congolese
20–30 years old	4	9
31–40 years old	7	2
41–50 years old	15	6
51–60 years old	0	5
60+ years old	4	1
Time spent in Belgium		
— 5 years	6	6
— 10 years	5	1
— 30 years	11	15
30+ years	8	1
Education		
No diploma	18	4
Secondary diploma	6	7
Bachelor	5	6
Master	1	6
Urban/rural		
Large city	6	21
Medium city	7	1
Small city	17	1
Activities before initially migratir	ng	
In agriculture	12	2
Self-employed	7	2
Employee	6	6
Unemployed	5	3
Student	0	10

 Table 1
 Sociodemographic characteristics of respondents

the first author to code, analyze and structure the data thematically. The participants were asked to discuss their life history and to describe their migration trajectories as a narrative, telling their own life histories. Afterwards, the interviewer asked additional clarifying questions in the second part of the interview. To preserve the integrity and richness of the data, we retain the uniqueness of the respondents' voices and the way they recount their experiences (Merriam, 1998; Van Caudenberg et al., 2020). Accordingly, through 'biographical portraiture' our research findings will be set within broader social life stories, emphasizing context (Rodríguez-Dorans & Jacobs, 2020). This enables us to shed light on underlying processes and interactions between different migration drivers (Eastmond, 2007).

Results

In the next sections, we first start our empirical analysis by examining how respondents look back on their initial migration aspirations and weigh up the importance of the changing natural environment in their region of origin in the development of these aspirations. Hence, we further our understanding on how migration reasons change over time and place during the (multi-stage) migration process. Second, we compare the role played by migration networks and the prevailing migration culture in the development of migration aspirations and actual migration trajectories of migrants coming from Morocco and DR Congo.

Initial migration aspirations and the role of the changing environment

Our findings illustrate the importance of taking individual characteristics, such as gender, age, and region of origin, into account when discussing migrants' migration trajectories. All the Moroccan migrants interviewed were aware of the main trends in environmental change in Morocco. They mainly stated that there are more periods of drought, less rainfall and more unpredictable rainfall patterns. For example, the following quote from Siham (51 years old, Kassita) shows that she is clearly aware of environmental change, how this affects people's livelihood in agriculture:

"There really is a lot of drought and the worst thing is that we are all used to this so we are extra sparing with water because otherwise we really don't make ends meet. But we have often been lucky because relatives of mine in Errachidia have had to deal with forest fires several times, which has completely destroyed their olive trees. "

Although these changes were mentioned by all the Moroccan respondents, only a third experienced these changes themselves. These were mainly respondents who moved first from rural to urban areas, and then abroad. A different set of cases involved respondents from large cities and young people who were not active in agriculture; they mainly recall narratives of environmental change hampering peoples' livelihoods.

"I find that very painful, especially for a country like Morocco where so many people work in agriculture. We have never really felt many consequences, but people working in agriculture are affected by environmental change. [...] There is already a lot of poverty in Morocco because of the inequality and the environmental problems are

only going to get worse." - Touria (50 years old, Tangier)"

Especially for young people, it was more difficult to examine this topic in greater depth. This was the case for Malik, a 30-year-old man from Agadir: "*I actually know very little about it and I've never worked in agriculture either. My parents did, but I got married very quickly and started looking for another job. So I never really worked in agriculture myself*". By contrast, 11 of the 30 Moroccan respondents who previously worked in the agricultural sector in Morocco were themselves severely affected by drought and found it easier to make links to slow-environmental changes with their daily lives in the country of origin. For example, Khadija explains how it became much more difficult to estimate when it was best to sow seeds, causing many harvests to fail. Here, she makes a comparison between praying for rain and getting pregnant:

"In Morocco, I thought about it [environmental change] every day. We were really going to pray for rain, you can compare that to getting pregnant. Then you have to wait every month and here you wait for rain so the seeds can be harvested. The first month is not so bad, but after a few months you lose your patience and hope every day you are pregnant. This was also the case for agricultural work."

Thus, it was mainly people doing agricultural work who seemed to experience environmental change in Morocco. Mainly older respondents were able to tell us about this in detail and had experienced in person the consequences of environmental change.

As we interviewed relatively more students within the sample of Congolese respondents, due to the larger inflows of student migrants into Belgium coming from DRC, they were less aware of environmental changes. For the Congolese respondents, environmental changes in DR Congo did not affect everyone. Nadine, a 22-year-old from Kinshasa, the largest city and capital of DRC, is one of these respondents: "*No, actually, I don't. That's a terrible thing to say, but I really don't know anything about environmental change in Congo. That's actually something I'd like to know more about but I don't think it has an effect on many peoples' livelihood.*"

Similarly to the Moroccan migrants from large cities and young people not active in agriculture, a large part of the Congolese sample recall narratives, heard from family or in the media, of environmental change hampering peoples' livelihoods. They mainly reported that they were not affected by environmental change themselves, but were aware of others being affected by more drought and less rainfall. As these respondents mainly came from Kinshasa, they did not work in agriculture themselves or had no one in their network who depended on environmental factors for their livelihood. Hence, as the quotes below show, respondents do not deny the existence of environmental changes in their region of origin, but do not see any link with their own reasons to migrate:

"I don't know if environmental change is also causing migration processes to start from Congo. Certainly not abroad. But people are being pushed away mainly because of war and political circumstances." – Baelo (DR Congo, Kinshasa, 31 years old)

"In Morocco, drought certainly plays a role. I know we had problems growing our tomatoes 20 years ago so I think it will be much worse now. Because you can also see that rivers that I used to know and played in are now dry. That's why the next generation doesn't even know that river. But that doesn't make people want to leave, that's more because there's no work and you just have better rights and more equal opportunities in Europe." – Karima (Morocco, Nador, 36 years old)

Our findings also show how some changes are more easily observed (e.g., precipitation patterns or extreme events) than others (e.g., forest management and conservation). People are more aware of environmental changes when they affect livelihood activities, such as agriculture (De Longueville et al., 2020; Van Praag et al., 2021). De Longueville and colleagues (2020) also demonstrate in their study in West Africa how people perceive environmental changes in various and distinct ways, depending on their living environment and the type of environmental changes that affected their livelihoods. In addition, people's knowledge of climate change discourses, local environmental policies, and (religious) beliefs also play an important role in the interpretations and explanations people give for such changes.

Changing aspirations during rural-urban migration

Our findings show how environmental change can compromise individual household income through erosion of livelihoods (for example increasing risk of harvest losses). Yet, findings also show that respondents are more likely to refer to the desire to find another job to reduce their dependency on the natural environment for their livelihood. Therefore, environmental change can be seen as 'a hidden narrative'; while it underpins our respondents' stories, they do not explicitly consider it to be a major economic difficulty. This can be illustrated by quotes from Mohamed (Morocco, Fez, 57 years old) and Desiree (DR Congo, Kivu, 53 years old):

"We weren't thinking about Europe, that mentality actually prevails less in small provinces. In smaller provinces, there is sometimes still violence or people there live seriously in poverty also because of more unpredictable weather conditions and bad roads that make the sale of their products more difficult. They want to leave quickly and then Europe or the West suddenly seems very far away. They must have money for that and those people often have no money. [...].So if they decide to migrate then they will think more like us of Kinshasa, or rather go to Cameroon or countries closer because the journey there is much shorter." Desiree (DR Congo, Kivu, 53-years old) "Because agricultural production is under pressure, more and more people are looking for an income somewhere else. Because of this, more and more people are looking for a job, and also because so many people work in agriculture in Morocco, it certainly has an impact on the economy of Morocco when many harvests fail. [...] That is why many people's aspiration to migrate arises, mainly because they want a better life financially, and once they have had to start all over again, the next step is easier to take." - Mohamed (Morocco, Fez, 57 years old)

This shows how the migration trajectories of people originally from rural areas, compared to those from cities, were almost always fragmentary in nature. For this group, the initial migration objective was to migrate internally, heading towards a larger city within their country of origin. The migration to this city itself eventually decreased the '(mental) distance' to Europe, and can have an impact on the possibilities to finance this step, making it easier to aspire to and undertake international migration. This is in line with Belloni (2019), who states that migration reasons change over time and place. By contrast, those born and raised in larger cities in their country of origin with a higher socioeconomic status, are more inclined to immediately aim for international migration. In our sample, this was more often the case for the Congolese than for the Moroccan sample. This was also exemplified by Nadine (DR Congo, Kinshasa, 22 years old), who noted that after her father arrived in France, he was able to obtain further information about possible other European countries to migrate to:

"So my parents broke up and I migrated with my father and he took us to France because his sister lived there. Then he got to know my stepmom and then came to Holland. He found the Netherlands much more expensive, especially in terms of taxes and because Germany was very racist at the time he chose to come and live in Belgium. I also think that we were very lucky because we already had enough resources to be able to choose freely where to settle."

This section demonstrates the importance of a biographical approach when studying environmental migration, since environmental factors do not remain consistently and strongly present throughout a migration trajectory. If environmental factors were less important during the last stage of the migration process, these factors are also less likely to be mentioned when people are asked merely about the migration process to Belgium itself.

Interplay between environmental change and different drivers of migration

Our findings show that, for those whose livelihoods were affected by ongoing environmental changes, economic insecurity cannot be seen separately from those changes. Six, then, out of the 14 Moroccan women involved in this study come from a rural area, and five of these respondents stated that they stayed behind in the village and took care of the household. The quote below is from Aicha, a 65-year-old Moroccan woman from Khenifra, who states that many men from her region have to look for an extra income:

"My husband was often away for a few months every other month to work in the industry and only came back afterwards. Of course, I did not want that, but there was no other option to survive and have some income. That was also normal in our region that men had to leave to work in surrounding cities. He really had no choice because there was very little work here and they cannot just wait until the harvest is ready. So in the summer I had to work as much as possible and earn money on the basis of tourists who came to visit the river, so I got up at 6 o'clock in the morning to prepare the tables."

First, this quote suggests that gender plays a role in determining who moves and how these moves take place (Chindarkar, 2012; Zickgraf, 2018). Second, as shown by the analyses, most respondents who migrated from rural areas do not relate their migration drivers to environmental changes, but rather speak in terms of economic hardship. Environmental changes are noticed, but people do not always link this to their reasons for migration. Aicha's quote additionally illustrates how the household, and not the individual, can be the unit where migration-decision making is made (McLeman & Gemenne, 2018). The departure of her husband can be seen as a collective risk-spreading strategy.

"These were mainly economic reasons; my wife couldn't find a job and my income kept getting lower. There was also a lot more competitiveness in the agricultural sector so that certainly had an impact on my income. My son really did send us money every month, even though I knew he didn't have that much extra income and so I thought why don't we take that chance ourselves to make a new start [...] in the end, my son was able to arrange a visa for us" – (Yaro, DR Congo, Katanga, 58 years old)

This quote from Yaro, who was also dependent on agricultural activities, suggests that although environmental changes were perceptible, they were not perceived as a recurring driver for migration to Belgium. This shows how environmental change can affect economic activities and family reunification decisions. In the case of Morocco, situations such as severe drought, in addition to economic problems, create dissatisfaction, and increase the need for more public investment. Particularly in the northern Rif region, which was already neglected for years by the previous king Hassan II (Houdret & Harnisch, 2019), respondents argue that a lack of adaptation strategies for environmental change can strengthen frustration with the government:

"I think that fishermen and farmers are mainly very frustrated with how little preventive action is taken for them. They also feel that something is only done when they are in need. Dams have also been built and there was a lot of media attention on that. Now those dams are hardly maintained and there is so much dirt and sand in them." (Karima, Morocco, Nador, 36 years old)

As shown in these quotes, a lack of investment by the local/national government and too little knowledge about possible adaptation strategies among the local population result in economic problems and political frustration.

Migration networks and the prevailing culture of migration

A comparison of how cultures of migration and migration aspirations have developed within Morocco and DR Congo shows that environmental change has some influence on migration decision making, but this is hard to disentangle. When asked about their reasons for undertaking international migration, respondents often mentioned that people within their network or coming from their region of origin had already migrated to Europe. This confirms the importance of a transnational migration network, and how it can stimulate migration aspirations, as also illustrated by the quote from Rachid, a 40-year-old man (Morocco, Settat) who discloses that he became jealous of the lives of people abroad. He also mentioned that social media played a crucial role in this:

"Actually, that was something that came more and more into my head. Also because you have more social media and you see people living well abroad and having nice jobs and nice cars, etc. You do get jealous and you want to have that too."

Rachid's quote shows the importance of a positive 'culture of migration' which portrays migration as a desirable thing, influencing the development of migration aspirations in the region of origin and created by feedback mechanisms from previous international migrants (Timmerman et al., 2014). First, most of the Congolese migrants come from the metropolis Kinshasa, where a large share of international networks and companies are located. In addition, the majority of the Congolese immigrants already had a higher socio-economic status in their country of origin and had already obtained a relatively higher education level. The Moroccan sample was more varied in terms of socioeconomic background and came from different regions in Morocco. Some respondents from larger cities in Morocco had already migrated internally. Various towns and villages in Morocco are suffering from falling agricultural output (and investment) and have difficulties finding sufficient (good) working opportunities for their citizens. This has a major impact on migration aspirations. Latifa, a 67-year-old woman (Morocco, Elcasita), also tells how life changed after the recruitment of some Moroccan men from her village (in the 1970s according to her):

"Leaflets were distributed in Morocco for work in Belgium and then they insisted that they had to take everything with them. [...] That was a big transition phase because you suddenly had families that were supported by people in Belgium and France and you felt that people suddenly became jealous and wanted their husbands to work abroad as well."

This interview extract shows how inequalities emerged in many Moroccan regions due to the sending of remittances. In addition, the majority of respondents from both migrant groups sent financial remittances to their region of origin. For example, Desiree (DR Congo, Kivu, 53 years old) reflects on the importance of remittances for the home community:

"Yes [they send remittances], we're still Africans and that's normal for us. We're going to help them when people need it and we have to support them."

This quote shows that most respondents see the sending of remittances and support of their networks in their regions of origin as a moral obligation. They feel responsible for their family in their region of origin and emphasize that remittances matter to improve the ability of households to support themselves. This shows how international migration can be viewed as a household response to reduce income risks, as remittances are being viewed by migrants and families in the country of origin as income insurance (De Haas, 2007). Saïda, a 26-year-old woman (Morocco, Berkane), explains how people who are struggling to make ends meet use their connections abroad to improve their life situation:

"A part of my family still lives in agricultural areas and there you notice that they are having a very hard time. For example, the cows don't have any milk left so they have to buy milk from a bus and that certainly wasn't the case in the past. A lot of their land has also been destroyed by storms and too much rain, so they are having a hard time. So you do notice that they are asking us more and more."

People from rural areas thus appear to be more affected by changes in the natural environment. Existing migrant networks in Belgium can help provide them with the necessary information on environmental change patterns and ways of dealing with such changes. In addition, existing migrant networks further accelerate the development of migratory capabilities, as individuals can rely on their network to provide the resources needed, through remittances, to migrate.

Discussion

The multiple relationships between migration and environmental change are extremely difficult to disentangle and quantify, which makes straightforward predictions problematic. In addition, migration scholars have only recently started to incorporate environmental factors into their models and theories (e.g. Age of Migration, (de Haas et al., 2020)). These models imply that migration is always the result of carefully weighed-up migration decisions. However, it is quite difficult to recognize environmental changes in one's immediate environment (De Longueville et al., 2020). This study, which conceives of migration as a multi-stage process, enables a better understanding of how domestic and international migration processes are linked. Particularly, when we relate this to international migration, the assumption has often been that migrants first move within their own country to an urban environment where the likelihood of them emigrating abroad increases significantly, with a departure abroad as only the final "step" in their migration life path (Brown & Sierra, 1994). This allows us to demonstrate how different drivers of migration interact and influence the migration decision process. We took a migrant's perspective, starting from biographies of Moroccan and Congolese immigrants living in Belgium, and examined how they perceived environmental changes in their countries of origin. Our analyses show that migrants' ideas concerning environmental change depend to a large extent on their region of origin (Morocco/DR Congo; rural/urban). Although most participants acknowledge general environmental changes, such as drought and changes in rainfall, it was mainly people working in the agricultural sector who could link this to their own lives. This can be explained by the fact that the ability of individuals to detect environmental changes and how meaningful and relevant such changes are for people is also likely to be dependent on other factors, such as livelihood, dependence on local weather patterns, geographic and interpersonal differences (De Longueville et al., 2020; Howe et al., 2014). The Congolese sample was made up of younger, more highly educated respondents from big cities – which is typical of Congolese migrants living in Belgium (Houtman et al., 2010). This partly explains why they experienced the impact of these environmental changes to a lesser extent than the Moroccan sample. When respondents facing environmental change do refer to migration, they distinguish between temporary and permanent migration.

First, our study shows that awareness of environmental changes does not automatically lead to the development of national and international migration aspirations. The results show that the direct relationship between environmental change and migration is hardly understood as such. If there are no legal migration channels for environmental reasons, migration aspirations are expressed and framed through alternative available categories and procedures, such as economic reasons or family reunification. Hence, our findings show that respondents do not consider slow-onset environmental change as a 'valid' reason for migration, because they know that legislation does not consider this factor as sufficient justification for crossing the border. This shows how political processes influences how migrants view their own migration trajectories. Therefore, respondents do mention a wide variety of reasons to migrate, including environmental ones, but place particular more focus on economic, educational and political motives. This study finds that respondents are more inclined to adapt to the changes or to seek alternative livelihoods, so that if people want to migrate, other migration motives are given. This does not mean that environmental factors do not play a role, but rather indicates that it is difficult to make links, in individual cases, between environmental changes and migration aspirations and patterns. Hence, our research suggests that it is important to take the complexity of migration decision-making processes into account when studying environmental migration.

A second main finding of this study is that migration reasons change over time and place throughout the trajectory (see also Collyer, 2010; Belloni, 2019). Particularly, environmental factors do not always remain consistently and strongly present throughout a migration trajectory. If environmental factors were less important during the last stage of the migration process, these factors are also less likely to be mentioned when people are asked merely about the international migration process itself. This is in line with previous literature demonstrating that people are not always aware of environmental changes and of how these impact migration drivers and aspirations (De Longueville et al., 2020; Van Praag, et al., 2020). This shows the importance of a biographical approach in which we can demonstrate the multi-stage migration process. As reported by De Longueville et al. (2020) when respondents facing environmental change refer to migration, they distinguish between temporary and permanent migration.

A third main finding is that the effects of environmental change on migration decision-making vary according to economic activities and livelihoods, gender roles and responsibilities within the household. These differences are important as they affect the migration decision-making process and are in line with previous research on environmental migration (Black et al., 2011, 2017; Warner, 2012; Wiegel et al., 2019; Zickgraf, 2018). Women from rural regions stayed longer in agriculture than their partners and took care of the household. Furthermore, economic and political factors also appear to interact with each other. The extent to which environmental factors influence these economic and political factors depends on a country's political situation.

Some limitations should be noted. Given that our analysis was based largely on the respondents' accounts of their lives, the level of biographical detail which we were able to collect could be partly limited by problems of recall (Rosenthal, 2004). Particularly, current perceptions of environmental change can give a biased view of previous values and interpretations of individuals' experiences. Moreover, we were able to conduct interviews mainly with people in the age-range between 20–30 years old in the DR Congolese target group while this was not the case for the Moroccan group. This may have had an impact on our results. This difference is mainly related to the different migrant reasons of these migrant groups. Many of the DR Congolese respondents came to Belgium with a study visa (Portes & Fernández-Kelly, 2015) while most Moroccan respondents came through family reunification procedures and/or economic purposes (Timmerman et al., 2017).

Despite these limitations, applying a biographical approach enabled us to map previously hidden values and environmental factors, thus contributing to a deeper understanding of international mobility. In addition, this study provides new empirical evidence on the relationship between weather patterns, perceptions of environmental change, and migration and shows how environmental factors can influence migration pathways. It shows how important it is for future research on environmental migration to relate environmental changes or states to a particular period of time, allowing a better analysis of how environmental changes have occurred and are perceived (Wodon et al., 2014). In addition, when studying environmental factors in migration trajectories, migration should be studied as a multi-stage process (Collyer, 2010).

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Author contributions

LO-S: conceived and designed the analysis, collected the data, performed the analysis, wrote the paper. LVP: de\$signed the analysis, performed the analysis, wrote the paper. GV: Performed the analysis, wrote the paper. All authors read and approved the final manuscript.

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Availability of data and materials

The data that support the findings of this study are available from the corresponding author upon request.

Declarations

Ethics approval and consent to participate

All procedures were in accordance with the ethical standards of the University of Antwerp. In addition, the research was reviewed by the Ethics Committee of the University of Antwerp and approved (case number SHW_19_33).

Competing interests

The authors declare that they have no competing interests.

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References

Alders, M. (2005). Prognose van gezinsvormende migratie van Turken en Marokkanen. *Bevolkingstrends*, 53(2), 46–49.
 Alscher, S. (2011). Environmental degradation and migration on Hispaniola Island. *International Migration*, 49, e164–e188.
 Apitzsch, U., & Siouti, I. (2007). Biographical analysis as an interdisciplinary research perspective in the field of migration studies. *Research Integration*.

- Bates, D. C. (2002). Environmental refugees? Classifying human migrations caused by environmental change. *Population* and environment, 23(5), 465–477.
- Beine, M., & Jeusette, L. (2018). Climatic factors and human mobility: a meta analysis of the literature. *Manuscript (in progress).* 28For example, the thesis of a Syrian" climate war" has been challenged in the literature (Fröhlich).

Belloni, M. (2019) The big gamble: Eritreans migrating to Europe. Berkeley: The University of California Press. https://www.ucpress.edu/book/9780520298705/the-big-gamble

- Benassi, M. (2008). Drought and climate change in Morocco. Analysis of precipitation field and water supply. *Options Méditerranéennes*, *80*, 83–87.
- Bertoli, S., Docquier, F., Rapoport, H., & Ruyssen, I. (2020). Weather shocks and migration intentions in Western Africa: Insights from a multilevel analysis. *Journal of Economic Geography*, *22*(2), 289–323.
- BISA. (2018). Brussels instituut voor statistiek en analyse. Retrieved from http://bisa.brussels/cijfers/kerncijfers-per-gemee nte/stad-brussel#.XGGFwDNKg2w.
- Black, R., Adger, N., Arnel, N., Dercon, S., Geddes, A., & Thomas, D. (2017). Foresight: Migration and global environmental change, final project report.
- Black, R., Bennett, S. R., Thomas, S. M., & Beddington, J. R. (2011). Climate change: Migration as adaptation. Nature, 478(7370), 447.
- Bousetta, H., Jacobs, D., Kagné, B., Martiniello, M., Nys, M., Rea, A., & Swyngedouw, M. (2002). Multicultural policies and modes of citizenship in Belgium: The cases of Antwerp, Liège and Brussels.
- Brown, L. A., & Sierra, R. (1994). Frontier migration as a multi-stage phenomenon reflecting the interplay of macroforces and local conditions: The ecuador amazon. *Papers in Regional Science*, 73(3), 267–288.
- Buurtmonitor. (2019). De stad in cijfers. Retrieved from https://stadincijfers.antwerpen.be/dashboard/hoofd-dashboard/ over-stad-in-cijfers/

Castles, S. (2013). The forces driving global migration. Journal of Intercultural Studies, 34(2), 122–140.

- Chindarkar, N. (2012). Gender and climate change-induced migration: proposing a framework for analysis. *Environmental Research Letters*, 7(2).
- Collyer, M. (2007). In-between places: Trans-Saharan transit migrants in Morocco and the fragmented journey to Europe. *Antipode*, *39*(4), 668–690.

Collyer, M. (2010). Stranded migrants and the fragmented journey. Journal of Refugee Studies, 23(3), 273–293.

De Haas, H. (2007). Remittances, migration and social development: A conceptual review of the literature. United Nations Research Institute for Social Development.

De Haas, H. (2014). Morocco: Setting the stage for becoming a migration transition country? Migration Policy Institute. de Haas, H., Miller, M. J., & Castles, S. (2020). The age of migration: International population movements in the modern world. Red Globe Press.

- De Longueville, F., Ozer, P., Gemenne, F., Henry, S., Mertz, O., & Nielsen, J. Ø. (2020). Comparing climate change perceptions and meteorological data in rural West Africa to improve the understanding of household decisions to migrate. *Climatic Change*, *160*(1), 123–141.
- Driouech, F., Déqué, M., & Sánchez-Gómez, E. (2010). Weather regimes—Moroccan precipitation link in a regional climate change simulation. *Global Planetary Change*, 72(1–2), 1–10.
- Eastmond, M. (2007). Stories as lived experience: Narratives in forced migration research. *Journal of Refugee Studies*, 20(2), 248–264.
- El Yaouti, F., El Mandour, A., Khattach, D., Benavente, J., & Kaufmann, O. (2009). Salinization processes in the unconfined aquifer of Bou-Areg (NE Morocco): A geostatistical, geochemical, and tomographic study. *Applied Geochemistry*, 24(1), 16–31.

Elliot, J. (2006). Using narrative in social research: Qualitative and quantitative approaches. SAGE Publications.

- Findlay, A., & Li, F. (1997). An auto-biographical approach to understanding migration: The case of Hong Kong emigrants. *Area*, 29(1), 34–44.
- Flahaux, M. L., & Schoumaker, B. (2016). Democratic Republic of the Congo: A migration history marked by crises and restrictions. *Migration Information Source: fresh thought. authoritative data. global reach.*, 2016(1).

Gemenne, F. (2011). Why the numbers don't add up: A review of estimates and predictions of people displaced by environmental changes. *Global Environmental Change*, *21*, S41–S49.

- Halfacree, K. H., & Boyle, P. J. (1993). The challenge facing migration research: the case for a biographical approach. Progress in Human Geography, 17(3), 333-348.
- Houdret, A., & Harnisch, A. (2019). Decentralisation in Morocco: A solution to the 'Arab Spring'? *The Journal of North African Studies*, 24(6), 935–960.
- Houtman, K., DeClerck, M. L., & Clycq, N. (2010). De Congolese jongeren aan het woord: een kijk op de schoolse en sociale situatie van Congolese jongeren in Brussel. Universiteit Antwerpen - CeMIS.

Howe, E. L., Huskey, L., & Berman, M. D. (2014). Migration in Arctic Alaska: Empirical evidence of the stepping stones hypothesis. *Migration Studies*, 2(1), 97–123.

- Hunter, L. M., Luna, J. K., & Norton, R. M. (2015). The environmental dimensions of migration. *Annual Review of Sociology*, 41, 377.
- IOM (2013), « Approche migration et environnement en République démocratique du Congo 2014-2017 ». IOM, 17 p.
- IPCC (2014). Climate change 2014: synthesis report. Contribution of Working Groups I, II and III to the fifth assessment report of the Intergovernmental Panel on Climate Change. IPCC.
- Isaakyan, I., & Triandafyllidou, A. (2017). "Sending so much more than money": Exploring social remittances and transnational mobility. *Ethnic and Racial Studies*, 40(15), 2787–2805.

Kartiki, K. (2011). Climate change and migration: a case study from rural Bangladesh. Gender & Development, 19(1), 23–38.

Khattabi, A., Chriyaa, A., Hammani, A., & Moudoud, B. (2014). Vulnérabilités climatiques et stratégies de développement: Synthèse et recommandations stratégiques pour une prise en compte du risque «climat» dans les politiques et stratégies sectorielles. *Mars*.

Maystadt, J. F., & Mueller, V. (2012). Environmental migrants: a myth?. IFPRI-Research Brief, (18).

McLeman, R., Moniruzzaman, M., & Akter, N. (2017). Environmental influences on skilled worker migration from Bangladesh to Canada: Environmental migration Bangladesh-Canada. *The Canadian Geographer*, 62(3), 352–371. https:// doi.org/10.1111/cag.12430

McLeman, R., & Gemenne, F. (2018). Routledge handbook of environmental displacement and migration. Routledge.

- Merriam, S. B. (1998). Qualitative research and case study applications in education. Revised and expanded from case study research in education. Jossey-Bass Publishers.
- Michellier, C., Pigeon, P., Paillet, A., et al. (2020). The challenging place of natural hazards in disaster risk reduction conceptual models: Insights from Central Africa and the European Alps. *International Journal of Disaster Risk Science*, 11, 316–332. https://doi.org/10.1007/s13753-020-00273-y
- Nawrotzki, R. J., & Bakhtsiyarava, M. (2017). International climate migration: Evidence for the climate inhibitor mechanism and the agricultural pathway. *Population, Space Place, 23*(4), e2033.
- Ní Laoire, C. (2008). 'Settling back'? A biographical and life-course perspective on Ireland's recent return migration. Irish Geography, 41(2), 195–210.
- Nouaceur, Z., & Murărescu, O. (2016). Rainfall variability and trend analysis of annual rainfall in North Africa. International Journal of Atmospheric Sciences, 2016.
- Portes, A., & Fernández-Kelly, P. (2015). The state and the grassroots: Immigrant transnational organizations in four continents. Berghahn Books.
- Ravenstein, E. G. (1885). The laws of migration. Journal of the statistical society of London, 48(2), 167–235.
- Reniers, G. (1999). On the history and selectivity of Turkish and Moroccan migration to Belgium. *International Migration*, 37(4), 679–713.
- Rodríguez-Dorans, E., & Jacobs, P. (2020). Making narrative portraits: a methodological approach to analysing qualitative data. *International Journal of Social Research Methodology, 23*(6), 611-623...

Rosenthal, G. (2004). Biographical research. Qualitative research practice, 48-64.

- Ruyssen, I., Everaert, G., & Rayp, G. (2014). Determinants and dynamics of migration to OECD countries in a three-dimensional panel framework. *Empirical Economics*, 46(1), 175–197.
- Schilling, J., Freier, K. P., Hertig, E., & Scheffran, J. (2012). Climate change, vulnerability and adaptation in North Africa with focus on Morocco. Agriculture, Ecosystems Environment, 156, 12–26.

Schoonvaere, Q. (2010). Studie over de Congolese migratie en de impact ervan op de Congolese aanwezigheid in Belgie: Analyse van de voornaamste demografische gegevens. Myria.

Shen, S., & Gemenne, F. J. I. M. (2011). Contrasted views on environmental change and migration: The case of Tuvaluan migration to New Zealand. *International Migration*, 49, e224–e242.

Stark, O. (1978). Economic-demographic interactions in agricultural development: The case of Ruralto-Urban Migration. FAO. Stark, O., & Taylor, J. E. (1991). Migration incentives, migration types: The role of relative deprivation. The Economic Journal, 101(408), 1163–1178.

Swyngedouw, E., & Swyngedouw, E. (2009). The Congolese diaspora in Brussels and hybrid identity formation: Multiscalarity and diasporic citizenship. Urban Research & Practice, 2(1), 68–90.

Timmerman, C., Hemmerechts, K., & Marie-Lou De Clerck, H. (2014). The relevance of a "culture of migration" in understanding migration aspirations in contemporary Turkey. *Turkish Studies*, *15*(3), 496–518.

Timmerman, C., Fadil, N., Goddeeris, I., Clycq, N., & Ettourki, K. (2017). Moroccan migration in Belgium: More than 50 years of settlement (Vol. 1). Leuven University Press.

Van Caudenberg, R., Clycq, N., & Timmerman, C. (2020). Feeling at home in school: Migrant youths' narratives on school belonging in Flemish secondary education. *European Educational Research Journal*, 19(5), 428-444.

Van der Land, V., Romankiewicz, C., & van der Geest, K. (2018). Environmental change and migration: A review of West African case studies. In Routledge handbook of environmental displacement and migration (pp. 163–177). Routledge.

Van Praag, L., Ou-Salah, L., Hut, E., & Zickgraf, C. (2020). Migration and environmental change in Morocco: In search for linkages between migration aspirations and (perceived) environmental changes. IMISCOE.

Van Praag, L., Lietaer, S., & Michellier, C. (2021). A qualitative study on how perceptions of environmental changes arelinked to migration in Morocco, Senegal, and DR Congo. Human Ecology, 50, 347–361.

Veronis, L., Boyd, B., & Obokata, R. M., Brittany. (2018). Environmental change and international migration: A review. In *Routledge Handbook of Environmental Displacement and Migration* (pp. 42-70). Routledge.

Viaene, V., Van Reybrouck, D., & Ceuppens, B. (2009). Congo in België: Koloniale cultuur in de metropool (Vol. 10). Universitaire Pers Leuven.

Warner, K. (2012). 17 Approaches to researching environmental change and migration: methodological considerations and field experiences from a global comparative survey project. *Handbook of Research Methods in Migration*, 366.

Wiegel, H., Boas, I., & Warner, J. (2019). A mobilities perspective on migration in the context of environmental change. Wiley Interdisciplinary Reviews: Climate Change, 10(6), e610.

WMO. (2020). State of the climate in Africa 2019. World Meteorological Organization, WMO-No. 1253.

Wodon, Q., Liverani, A., Joseph, G., & Bougnoux, N. (2014). Climate change and migration: evidence from the Middle East and North Africa. The World Bank.

Zickgraf, C. (2018). Immobility. In *Routledge handbook of environmental displacement and migration* (pp. 71–84). Routledge.

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