Chapter 6
How Environmental Change Relates to the Development of Adaptation Strategies and Migration Aspirations

The focus on perceived environmental changes and risks is a necessary precondition before people's vulnerabilities and abilities to migrate can be taken into account (Adam 2005). This approach contrasts with previous research on environmental migration that has mainly focused on the vulnerabilities of people towards environmental changes. This vulnerability approach is, for instance, widely used in reports of the Intergovernmental Panel on Climate Change (IPCC 2014) and refers to the potential loss or harm one encounters or could encounter when facing environmental changes. This vulnerability is assumed to depend on the nature of the physical risks one could be exposed to and inherent sensitivity one has. The latter refers, for instance, to the type of economic activities of a community. For example, communities that rely heavily on agricultural activities are more sensitive to water scarcity and suffer more from drought, than other communities. It is within this framework that migration is often seen as a potential adaptation strategy to deal with environmental changes (Smit and Wandel 2006; Gemenne 2010). However, this framework hardly considers people's own perceived vulnerabilities or risks or resilience towards environmental change. Hence, this vulnerability approach diminishes the agency of the actors involved and their active role in the development of migration aspirations and trajectories related to environmental changes and risks. Furthermore, as already stated by McLeman et al. (2016), the use of this framework of adaptation and the focus on the use of vulnerability may not encompass all drivers of environmental migration. This could certainly apply to the Moroccan context in which environmental changes mostly occur gradually and are to a lesser extent immediately visible to the human eye.

As shown in Chap. 5, the study of perceived environmental changes as well as the explanations given to understand these changes can be seen as a first step in understanding how environmental changes trigger specific decisions and behaviour (Moore 1995; Rigby 2016). When making a connection between perceived environmental change and behavioural change or responses in climate change policy discourses, one easily refers to the concept of 'climate change adaptation' (IPCC 2014). However, little is known about how these perceived environmental changes –

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especially in a particular Moroccan context – give rise to the development of adaptation strategies. When translating the adaptation strategies developed to deal with environmental change – a concept that is mainly prevalent in climate change policy discourses – into sociological terms, adaptation approaches can be seen as risk management practices that aim to reduce vulnerabilities due to climate change effects (Lidskog and Sundqvist 2012). Or put differently, perceptions of environmental change delineate the frameworks in which people perceive risks related to these environmental changes and anticipate or deal with the consequences of environmental risks. Therefore, building further on previous insights from sociology of risk (Douglas 1966), perceived and expected environmental change-related risks need to be taken into account to fully understand behaviour. This is important for the study of environmental migration as one first needs to understand how environmental risks are perceived before being able to examine how these risks are translated into actual migration aspirations and trajectories. When looking at migration theories, risk perceptions and spreading are also the starting point of the new economics of labour migration, which posits that households aim to diversify the risks brought about by environmental change (cf. Chap. 2; Hunter et al. 2015).

This chapter connects people's perceptions of environmental changes to the perceived risks, resilience, and adaptation strategies developed by Tangier and Tinghir residents. In doing so, attention is given to how the respondents themselves link environmental change to their risk management/adaptation strategies and migration aspirations and trajectories. These linkages are studied together with other migration motivations in order to map out the context in which environmental migration occurs and how it is conceived. This is necessary since in many cases, environmental factors only give rise to 'environmental migration' when they add up or interplay with other economic, humanitarian, political, or cultural reasons for migration (TGOFS 2011).

This chapter is innovative and adds to the existing body of literature as: (1) little is known about how perceived environmental changes are connected to migration aspirations by inhabitants in Morocco; (2) it includes the diversity of views on environmental changes and associated risks; (3) it considers environmental migration within a larger socio-economic and cultural context (see also Smith et al. 2012); and, (4) is situated in the Moroccan context where a wide range of (nation- or region-wide) adaptation strategies are being developed and implemented at the policy level (e.g., 2016 United Nations Climate Change Conference Marrakech; *Plan Maroc Vert*, cf. Chap. 3). Before setting out the empirical findings, I will provide an overview of the existing literature on the perceived environmental risks and how the linkages between environmental changes and environmental migration are studied in existing research.

6.1 Perceptions of Environmental Risks

Risk perceptions matter when discussing behavioural intentions to prevent environmental change (O'Connor et al. 1999). Three main aspects of (environmental) risks are important to consider for the present analyses in this book. First, as already noted by Douglas (1966), risks are socially constructed and depend on social organization. This is of particular interest when studying vulnerable groups within society since threats, such as disruptive consequences of environmental change, do not always come from outside society, but are related to problems within society as well. The study of perceived environmental changes and risks – especially of vulnerable groups within Moroccan society – could then give more insights into how these groups perceive the society in which they live and their position therein (cf. McLeman et al. 2016). This is even more relevant as environmental changes impact the livelihoods of people in very complex ways and interact with economic, political, cultural, and humanitarian factors (Mertz et al. 2009; McLeman and Gemenne 2018). Hence, especially people living in regions characterised by economic poverty, subsistence food production, and a low and highly variable natural production are affected by the disruptive effects of environmental change (Mertz et al. 2009).

Second, as demonstrated in the previous chapter, perceived environmental change and risks are shaped by religious ideas, beliefs, and approaches towards environmental issues (Rigby 2016). The vast diversity in cultural and religious differences pertaining to views on human-nature relationships is often overlooked in research (Salmón 2000). As also shown by the results of this study (cf. Chap. 5), there is no single perception or interpretation of environmental change across all members of one society. Additionally, in the Moroccan context, these perceptions and explanations are certainly not in line with the prevailing climate change discourses of the IPCC (2014) nor necessarily applied to one's immediate natural living environment. Furthermore, a wide variety of (mainly ecocentric and theocentric) views on the relationship between humans and nature suggest that environmental changes are not automatically linked to the development of adaptation strategies or migration (cf. Hoffman and Sandelands 2005; Rigby 2016). Many respondents make references to God and the harmonic relationship between humans and nature when discussing environmental issues. Introducing the wide range of human-nature approaches in current research is important because prevalent views in existing academic literature and policymaking on environmental issues place dominant Western perspectives on the human-nature relationship central. Consequently, these discourses fail to capture fully the decision-making processes of people living in non-Western societies like Morocco as they take on an anthropocentric approach (Rigby 2016). Such approaches assume a mastery-over-nature orientation, which is prevalent in Western culture and goes hand-in-hand with concern for environmental issues (Hand and Van Liere 1984; Vining et al. 2008). Hence, more insights are needed into the ways people perceive the risks related to such (perceived) changes in their natural living environment.

Third, risk perceptions related to climate change (and by extension, environmental change) are largely shaped and influenced by media, education, and scientific discourses (cf. 'reflexive scientization', a process in which scientific results and arguments are questioned, Beck 1992). These information channels play a crucial role in downplaying or exaggerating the risks of climate change (Zehr 2000). They thus demonstrate that risks are a social construct and that risk perceptions vary across social groups and contexts. The information channels used to learn about environmental changes are important to consider as they impact individuals' experiences of how environmental changes affect their living environment and standard of living (Gemenne 2010; Kelly and Adger 2000; Hillman et al. 2015). Additionally, as shown by the results of Chap. 5, the methods people use to learn about environmental changes and the associated risks differ across social groups and play a role in the extent to which people perceive an impact of environmental change on their immediate living environment and standard of living (see also Gemenne 2010; Kelly and Adger 2000; Hillman et al. 2015).

To summarize, risks are social constructs that vary across social groups and contexts, according to people's religious and cultural ideas, beliefs, and worldviews. Risks should be considered within their broader social, economic, political, and cultural context as well as media coverage. The focus on the study of risks is especially important when people are living in gradually-degrading areas. The slow degradation of the natural environment often makes it more difficult to distinguish environmental changes from other ongoing societal shifts. Moreover, it provides more space for the interpretation and calculation of environmental risks of people living in these regions. Consequently, people are able to develop appropriate strategies to counter the consequences of environmental changes.

6.2 Linking Environmental Changes and Risks with Migration

Migration, under certain conditions, could be seen as a possible adaptation strategy to deal with environmental change. For instance, as Gemenne (2010) argues, migration could be viewed as an adaptation strategy at a societal level, if it relieves demographic pressure or when remittances are actively used to diversify families' incomes or invest in other adaptation strategies. Hence, migration – whether seen as environmentally-driven or not – could be seen at a societal level as an adaptation strategy to deal with environmental change. However, at an individual level, the success of this so-called adaptation strategy is not so straightforward, nor is migration necessarily perceived as an adaptation strategy. It is important to note that people who do not perceive these risks in a similar way, or adapt their lifestyles to environmental changes regardless of their views, migration can still occur thus affecting how they frame their migration aspirations. This distinction between the conscious and unconscious development of adaptation strategies is important for

policymakers and community workers attempting to mitigate the effects of environmental change and assist people and communities in developing successful adaptation strategies. The lack of conscious development of adaptation strategies to deal with environmental change could result in maladaptation for a community in general or the lack of coordinated investments in the development of (organised) adaptation strategies to deal with environmental change. Ultimately, this may even lead to an increasing need to migrate or to increased vulnerability to deal with environmental change.

In the current body of literature on environmental migration and displacement, perceived environmental risks, as a precondition for people to identify with the 'category' of environmental migrants or search for alternative adaptation strategies to deal with these environmental changes in their immediate living environment, are hardly examined (Khare and Khare 2006; Rigby 2016). So far, only a few studies focus on the relationship between perceived environmental change, the development of adaptation strategies, and migration. The results largely indicate that weather trends are in many cases observed and lead to a change in agricultural practices. These changing weather patterns are not necessarily linked to actively-developed migration strategies but rely heavily on the socio-economic context of the families involved. Mertz et al. (2009) find that farmers in Senegal have a clear memory of the periods they suffered from extreme climatic conditions, as these disrupted their production; while the authors found a general decrease in excessive rainfall over the years, not all local inhabitants have remarked on this trend. Nevertheless, all respondents did notice more extreme droughts and longer periods of droughts over time. Interestingly, age effects were noted by the local population. Due to declining yields and fewer opportunities, young people left; their migration burdened the elderly who had to do more work. At the same time, these migration flows help to secure or diversify the household incomes of the older family members who stayed. The migration of relatively large groups of young people is then perceived to worsen the consequences of climate change precisely because of the heavy burden placed on the work of the elderly. It is important to note that the agricultural and livelihood changes are commented on but hardly causally linked in a direct fashion to climate parameters.

In another study, Bryan et al. (2009) focused on the perceptions of climate change, adaptation measures, and decision-making processes of farmers in Ethiopia and South Africa. Most farmers had tried irrigation, different crop varieties, planting trees, soil conservation techniques, and switching to planting dates. The study results indicate that these adaptation strategies do neither correspond to nor are not related to views on perceived changes in rainfall and temperature. Thus, although there is a range of perceived environmental changes, this did not directly influence respondents' farming practices. Adaptation strategies rather rely on credit, access to fertile land, wealth, and information about climate change discourses, and differ slightly according by country – i.e., Ethiopia and South Africa – and income. Similarly, in a third and more recent study, Jha et al. (2018) found that although perception of climate change is a prerequisite for the individual adaptation response,

socioeconomic conditions determine the vulnerability of farm households to climate-induced economic tragedy and social deprivation.

These studies suggest that environmental changes are noted, but not necessarily linked to the active deployment of adaptation strategies. This is especially not the case when it comes to migration aspirations or trajectories, which may not be surprising when looking at migration histories and the perceived human-nature relationship of the local population (Hoffman and Sandelands 2005; Adam 2005). For example, such was the case in a study by Boillat and Berkes (2013) on Quechua farmers in Bolivia. These farmers perceive climate change to be associated with social/environmental changes as a part of a larger cycle in which ancient/mythological times would return, thus these changes are interpreted as a reaction towards natural/spiritual entities that are considered living beings. Hence, migration as a social change is automatically related to environmental change. Furthermore, indigenous patterns of interpreting phenomena are considered an adaptive capacity and crucial to understanding human behaviour. As illustrated by Bolivian study, the interrelatedness of widespread ideas on the human-nature relationship within a local community need to be examined within a wider social, cultural, economic, and political context, and affects the adaptation strategies used to deal with environmental changes.

6.3 Results

Given the wide range of views and explanations on environmental changes and risks in the Moroccan regions studied in this book, it is not surprising that the perceived relationship between environmental changes and adaptation strategies, such as migration, is not so straightforward either. Additionally, environmental changes in Morocco mainly occur gradually, making it more difficult to view this relationship in a crystal-clear way as these shifts encompass a larger timespan. Sudden weather changes are increasingly noticeable, such as sudden snowfalls in the Todgha Valley, however, most changes relate to (slowly) increasing drought periods in an already dry region such as Tinghir and parts of Morocco (not necessarily in Tangier).

In order to gain more insights in the adaptation strategies deployed to deal with environmental change, such as migration, the results of this chapter are organized in two sections. A first focuses on whether and how people relate environmental changes and risks to adaptation/risk management strategies. A second section delves deeper into whether these adaptation strategies involve migration aspirations or projects. These accounts build further on the previous chapter and demonstrate that these perceived changes, risks, and adaptation strategies vary across social groups and regions in Moroccan society.

6.3.1 *Perceived Environmental Risks and the Development of Adaptation Strategies*

The data analyses show that the explanation given for environmental changes and the knowledge of climate change discourses matters for the development of adaptation strategies. This affects the development of risk management strategies and adaptation strategies in two ways: through risk perception and people's actual and perceived level of agency/ability to deal with such environmental changes. As shown in Chap. 5, there are multiple views and explanations of environmental changes. This seems reflected in the risks people perceive related to the natural environment and how people deal with such environmental changes. There are multiple ways in which people interpret their position towards environmental changes. The abundance of religious interpretations, harmonious views on human-nature relationships, and interpretations and knowledge of climate change discourses impact the development of adaptation strategies. Two main ways of approaching adaptation to environmental change are found in this study, which builds further on the perceptions and explanations of environmental change.

When environmental changes are seen as the will of God or as part of a natural cycle, responses are also more in line with these thoughts and more reactive. In doing so, people's responses are very much dependent on their resources and ability to deal with the consequences of environmental changes. Resulting already from previous analyses in this book, it seems that in the broad Moroccan context there are far more harmonious ways of dealing with environmental changes or people who frame these changes in their religious beliefs, compared to Western climate change discourses or international bodies working on climate change, such as the IPCC (2014). This seems to influence their preventive and reactive behaviour towards such environmental changes. This is shown by Walid's (31-year-old male teacher, Tangier) whose family migrated to Tangier before he was born:

> *Interviewer*: I heard that there is a lot of drought in Morocco?
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> *Walid*: Yes, yes, we search for work, we fight life, to change our lives, to change our living standards. If we don't search for work, we're not obliged to work, we do projects, sell things, do commerce. . .it's like that.
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> *Interviewer*: And those droughts you experience in Morocco, did it also impact the life of your father and his parents?
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> *Walid*: They started their life in the drought, my grandparents, it was entirely in the drought, because they had to build their house entirely themselves. They built their house together with two other men, because men are like that.
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> *Interviewer*: Do you also think they felt the need to adapt to drought?
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> *Walid*: Muslims know how to live like that. If they find something to make food, they eat. If not, they accept it. We have to combat it. There is always a plan, every day, there is a plan, there is no stress, it is always like that. One day, I will eat chicken, meat, fish, a very nice fish of the day from the market, couscous, tajines, and another day I will not eat. I will eat milk and bread. We accept, because we go to work to fight against it, to have money, it's not because we like to do the work.

Walid suggests that people do not intend to combat these environmental changes but rather adapt their ways of living to the changing living environment. This also

means that the adaptation strategies used to deal with environmental change are part of a larger view on people's way of living. This cannot necessarily be controlled and, hence, contrasts with the prevailing idea of mastery-over-nature in Western culture (Hand and Van Liere 1984; Vining et al. 2008). This idea of lack of control related to environmental change is also partly related to the finding (cf. Chap. 5) that environmental changes are ascribed to God's will, complicating the ways people in which deal with the consequences of these changes. This can be illustrated by showing the discussion between Thami (62 years old, retired migrant returned from Europe, Tinghir) and the local guide Jamal (40 years old, local guide/journalist, Tinghir/Rabat):

Interviewer: Are there a lot of changes in the environment?
Thami: Earlier, we used to have the rain, we had water. In contrast to now, especially in this region here, Ouarzazate, Errachidia, Zagoria
Jamal: There is no rain, there is no rain!
Interviewer: And why do you think there are changes in the level of water in these regions?
Jamal: It's climatic (laughs)
Thami: It's God
Interviewer: How do people here respond to these changes in the level of water?
Thami: People adapt to the lack of water, to climate changes.
Interviewer: Is this also the case for you ? Do you also think there is a lack of water?
Thami: For the fields. This means that everyone makes a well, in front of their house, with a water pump, there is electricity, we have our 'garden' and we do what we want to do.

People are seen as adaptive to environmental changes even though the underlying rationale attributes them to God. However, no action is undertaken to alter the lack of water, as this cannot be changed. People cope with the consequences of the decreasing groundwater/precipitation levels by digging wells and installing water pumps. These are frequently-recurring adaptation strategies mentioned by people living in Tinghir, and by extension, the relatives living in rural Morocco of people living in Tangier. This also implies that the consequences of environmental changes affect the livelihoods of people in a more indirect way. Furthermore, they interfere with other societal changes that happen at a similar speed. Thus, focusing on the group of people who perceive environmental changes as part of nature or God's will, people search for adaptation strategies that are within their ability and feasible given the resources available to them to cope with the consequences of environmental change on their livelihoods.

When environmental changes are framed as part of a larger climate change discourse, this phenomenon is mainly perceived at a global level. Hence, the ways of dealing with global climate change are also seen on a larger scale, meaning that most individuals do not feel able or entitled to combat these changes. In the following interview extract, it becomes clear that Jamal – who links changes in the precipitation level to climate changes – also more easily sees how these changes relate to the development of adaptation strategies:

Jamal: There is nothing. We have the mountains, the wind, we know the 'Gorge de Todgha'. There is a lot of international interest, but there is not enough structural equipment. It's an international zone that deserves to become recognized as a natural heritage of UNESCO, but

the association that deals with the gorge wants to let it be recognized at the national level, to end up, with UNESCO recognizing it as a heritage. The dams, every winter we suffer from desertification. We suffer from the drought. Imagine what would happen if there are dams that could keep water. Here, there is only one dam next to the route, luckily, but these dams need to be constructed by large companies and so on.

Due to his knowledge of climate change discourses, Jamal seems to link adaptation strategies more easily to environmental changes such as desertification and drought. As global phenomena such as environmental change often require large-scale solutions, such as the building of dams, this often requires a bird's eye view on the linkage between both. Thus, despite the need to invest in local or small-scale solutions to deal with the decreasing revenues due to environmental change, acknowledging this climate change discourse often reduces the intentions and the perceived capabilities to develop large-scale adaptation strategies, as suggested by Loubna (25 years old female student, Ouarzazate):

Interviewer: What do people now do – many people still living in the countryside and they see that the climate is changing: how do they deal with it? Some migrate and what do the others do?

Loubna: Some migrate, some keep praying [laughs] and being hopeful. And they tried to find some solutions to the problem. Just to survive. Because they are not powerful enough to do something which will stop this climate change. So they're just trying to find solutions to their daily problems, 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, so that they can make sure that they will have enough water. Even if it doesn't rain, they make it automated, with the motor, so that they can have the water, even if it's not raining. They can water their crops.

Interviewer: And they receive money from their family or?

Loubna: Yes, here families in Morocco help each other. For example, if I have some family members who are poor in the countryside, and I know it. . .if I want to help someone, even in my religion I should help them first. I can't just go in the streets and help anyone, because I know that I have someone in the countryside for example, or even a neighbour who is my relative, it's better to help him first.

Interviewer: And how does it work like. . .do they ask for money or?

Loubna: Yes, they ask for money and sometimes they are very shy they don't ask but people know that they are needy. They help them.

Interviewer: Ok and all the money is then really used for this well or. . .?

Loubna: For this well or for this specific thing, for this motor or just so they give them the money and they are free to do with it whatever they want. . . Sometimes they will just go and purchase some things that they need for their house.

Interviewer: Do people often help persons or projects?

Loubna: They help people right here. They don't put so much thinking into it because they are just individuals, but some associations help projects. Some associations, some organisations, that aim and support people in those very difficult areas. They support projects like. . .ehm. . .I forgot the name of one of the organisations. . . It's a governmental organisation supporting projects in the countryside, to help people cope with climate change and the difficult conditions they're facing.

Interviewer: And do they really see a change in climate change?

Loubna: No, we cannot see any climate change. Why? Because those people in the countryside or even in Morocco, it's not really the cause of this climate change. Yes, let's be honest about it. We're just the victims. Because the ones who are making so much money, who are very strong, they have very strong industries and economies, they are the ones

> affecting the climate in general. And those poor ones, they are the ones paying for the moment, but afterwards everyone will pay the cost of this.

As this interview extract suggests, the use of adaptation strategies very much depends on the resources people have at their disposal and their power to change this in their immediate living environment. This could also explain why risks related to environmental changes are less pronounced in respondents' accounts, and why most of them mainly referred to coping strategies as a survival means. Finally, it should be noted that the consequences of environmental changes affect the livelihoods of people in a more indirect way and interfere with other societal changes that happen at a similar speed. Consequently, people attempt to deal with the consequences of environmental change in order to improve their living standards or secure their livelihood. Most are not able to set up larger-scale projects that benefit the entire community and could prevent environmental changes from happening or deal with the long-term effects of environmental change. Moreover, the lack of unified discourses on environmental changes at a local level and the lack of an overview of all possible adaptation strategies may also cause people to 'merely' adapt as individuals/households to the human consequences of environmental change within their own capability.

6.3.2 The Link with Migration?

In this section, data analyses are presented on how environmental changes are perceived to relate to migration, and actual migration motivations. Overall, as shown in the previous section, individuals and households try to secure their livelihoods or living standards by taking measures that fall within their abilities. Since not everyone is able to do so, migrating to another place may become an appealing solution aimed at diversifying the household's income and at cutting connections with the natural living environment (cf. Gemenne 2010). Given the wide range of interpretations of environmental changes and associated adaptation strategies, the data analyses show that, for many respondents, it seems difficult to perceive a direct relationship between environmental change and migration. Compared to more practical solutions perceived to enable households to deal with the immediate consequences of environmental changes such as drought and water scarcity, it seems that this direct relationship is even harder to perceive when it comes to 'migration as an adaptation strategy' because of the complex interplay of factors underlying migration aspirations and trajectories (Van Mol et al. 2018).

As discussed in the previous section, respondents' perceptions of environmental changes are a first condition to actively link migration to environmental change. In Chap. 5, Budur (female, 24 years old, secondary education degree, Tangier) perceives environmental changes as something from ancient times. Consequently, when Budur is being asked about environmental changes in her living environment and as

a potential reason to migrate, she does not really see Morocco as 'the place' where this is happening:

> *Budur*: Climate changes. . . I don't think that's the reason [to migrate]. You really don't feel that much of it here. In Belgium, people feel it, it just snowed there [in March], so that's weird as it is spring. You don't really feel it here, so it could not be really a reason [to migrate].
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> *Interviewer*: Do people here talk about climate changes?
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> *Budur*: Ehmm. . . not really, they don't really do that, as you don't really notice it here. If you would sit here last year, at the same time, it would be exactly the same. I am talking now about the last couple of years, what I experienced. People talk about it, but it's rather short, and relates more to other countries than Morocco itself.
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> *Interviewer*: Which countries?
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> *Budur*: Sometimes, people talk about France, and the weather, what happens there, like it snows or something similar, but nothing special. Rather, discussing the news.

Apart from the importance of the explanations and perceptions of environmental change, reasons to migrate are numerous and frequently perceived from an economic, political, or family perspective. Therefore, the links with environmental factors are often blurry. For instance, Faiza (28 years old, return migrant from Belgium, currently living in Tangier) does not see environmental changes as sufficient reason to migrate. Her account illustrates that, since people are used to living in the drought, there should be other reasons motivating people to migrate:

> *Faiza*: It's not a question of drought, it's because people want to improve their lives.
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> *Interviewer*: And what happened to agriculture?
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> *Faiza*: The region is known for its agriculture, but this year we had a lot of rain, so it was a good year for agriculture. Even with regard to the filling of the dam, I heard that they managed to fill already 77 per cent of the dam with water, *ça va*. Two weeks ago they even had floods in Tangier, because there was so much water.
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> *Interviewer*: And who did it affect?
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> *Faiza*: Big companies, who are next to it. Because, really, last week, water entered the office, but luckily did no water damage.

While drought and water damage are acknowledged by both Faiza and Budur, this is not perceived as an immediate call for action or providing sufficient grounds to migrate. As Walid's account earlier already shows, people accept environmental changes to a larger extent and learn how to adapt their lifestyles in reaction to them. Faiza explicitly mentioned that it is just not a adequate reason to migrate and that 'superior' reasons, such as searching for better work opportunities, are more decisive in migration aspirations and decisions.

When asking respondents about their own migration aspirations and trajectories, it becomes even harder to see the extent to which environmental changes led people to migrate. Most respondents linked changing living standards to the need or the aspiration to migrate. Only people working in the agricultural sector or who were familiar with agricultural activities through social networks – which was generally more the case in Tinghir compared to Tangier – seemed to relate the deteriorating natural living environment to migration aspirations and trajectories. This was the case of Mouhcine (33-year-old café owner, Tinghir) and his male friends:

Interviewer: Did you see a lot of changes in the environment?

Mouhcine: Ah yes! A lot has changed!

Interviewer: In which way?

Mouhcine: We had rain during summer, but there was also the cold and the sun.

Interviewer: And how did this change?

Mouhcine: I don't know (laughs)

Interviewer: What do people do to adapt?

Mouhcine: They are forced... they are forced.

Interviewer: What do they do? (...)

Mamoun [friend of Mouhcine]: People migrate

Interviewer: They migrate

Mamoun: There are people who try to adapt, *voilà*, and start from one of their ideas to do an effort in agronomy, because here, we don't have large fields. It's just a small field to help people live and survive, nothing more. It's not a business agriculture.

Interviewer: Large...

Mamoun: Indeed, it's just an autonomous agriculture, to live and feed, voilà, only cows and sheep. Cows are only to get some milk, they put some effort to survive, they install new irrigation techniques, like drip irrigation.

Ghali [other friend of Mouchine]: It's a modern irrigation technique to conserve water since water is scarce so we have to save it. We have to do that so there is enough water for everyone. You shouldn't spill water. To conserve water and don't waste any water, you need drip irrigation to irrigate the small fields.

Interviewer: Thus, this *goutte-à-goutte* system...

Mamoun: *Goutte-à-goutte*, it's an irrigation technique, which allows us to irrigate the trees. Because earlier [starts to draw water irrigation canals], we had these water canals like this, which led to a lot of water waste, they waste a lot of water in the fields and they don't serve agriculture a lot. That's why they dedicate a lot to... it's like, only farmers do that, it is very limited. The majority are '*des chercheurs*' [seekers], most people don't waste their time on things like that, they migrate to Europe or larger cities.

Similar adaptation strategies are mentioned by Loubna (25 years old female student, Ouarzazate):

Loubna: What can he or she do, other than praying?

Interviewer: Okay, so people are too poor themselves to set a bigger project? So people that have livestock, do they really settle projects to go against this climate change?

Loubna: To cope with it? Yes, yes, they make some modifications to the weather. They're living their daily life and they're fattening for example their livestock, and the type of plants they're buying, sometimes they might buy some genetically modified grains...which will resist against the very high temperature and sometimes very little water... Also sometimes they will buy milking cows who can support the change in climate. They are doing some things because they see: 'Oh, I bought this type of grain and my neighbour bought the other type, and his crops are better than mine, why is that?'. And they're trying to do that.

These accounts indicate that people living in Tinghir and its environs are dealing with relatively small agricultural fields or small livestock, which may also hinder people's investment or interest in investing in these agricultural activities. At the same time, the economic hardship faced by people complicates any investments or the further development of advanced adaptation strategies. This makes migration a viable option and the search for migration opportunities seems omnipresent within this community (see Chap. 7). These accounts are harder to find in Tangier.

Overall, for the majority of the respondents who had migrated or who aspired to, the linkages between migration and the changing natural environment were overshadowed by the economic context and opportunities, as illustrated by the following insights from Loubna (25 years old, female student, Ouarzazate):

> *Interviewer*: Did it also affect you when you were thinking of your future, did you also consider environmental changes or. . .
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> *Loubna*: I really did not think about it (laughs) Because I don't see it directly affecting me for the moment being, because I don't rely on, for example rain, to have food on my table. Okay, right now we are importing a lot of things, we have a lot of cities who have good crops. So we're getting enough food, so I'm not concerned about my future. But I know that it's a problem. But it did not affect my decisions in any way.
>
> *Interviewer*: And from all people, how many people do you think it affects their lives, living in Ouarzazate?
>
> *Loubna*: I would say all of them. Because Ouarzazate does not have, as I said, big companies so it relies on the traditional way of earning a living. Which is having land and growing some crops and having some animals. . .

Internal migrants within Morocco who are searching for a place to work and create a future in Tangier also faced hardships due to the economic context and political struggles, as shown by the case of Amine (28-year-old male, migrated from Al Hoceima, works in a clothing shop in Tangier). In Al Hoceima, he worked in a hotel, where he had to work 12 consecutive hours, which was quite hard work and left no time for leisure activities. For him, migrating to Tangier was so much easier since he found a better job in a clothing shop through his networks. When referring to his life in Al Hoceima, he explained that it was very difficult, mimicking gunshots: '*beaucoup papapapapadam*', recalling political conflicts and the omnipresence of the police in that region at the time. While these political conflicts are ongoing, he also expressed his own educational or professional aspirations as a 28-year-old man. Although the origins of these political conflicts are initially related to a potable water problem, Amine mainly commented about the lack of economic and future opportunities for him:

> *Amine*: Last year, tomorrow, and after tomorrow, and the day after, there won't be any work, no hope, you can't work in a restaurant for 12 or 10 hours. It's just very hard to work 10 hours for 1 euro maximum. It would be better to work for 8 hours, and have a house, shower, food, etc.

Amine's account demonstrates very well the overall importance of migration and the development of migration aspirations when people are living in difficult living conditions, whatever the reason may be. The lack of any perceived linkage between environmental change and migration – or the presence of such a relationship – does not seem to hinder the development of migration aspirations and the desire to migrate to places with better opportunities or achieve personal dreams. While Amine referred to the current context, since he was also relatively younger, similar references were made when going back in time, as shown by the account of Zakaria, a 67-year-old guide, living in Tangier, who in his early years migrated to Germany, where he worked in a circus until he was injured. By having a closer look at

Zakaria's interview, similar cycles, of people migrating from Al Hoceima to Tangier, due to water issues are present:

> *Zakaria*: And most people like me, who came to Tangier, before, when Tangier got independence. They thought they could go to Europe and they find everything easily. Most young people, they dream about Europe, they think it is paradise there. It is not a paradise. There, if you cannot work, you cannot live. You know this, you are a German and know what is needed in Europe. And at that time, getting a passport was very hard here [in Morocco], especially for the second time [in his case], and also costs people a lot of money. And for me, when I turned 19 years old, I got my passport because I was having a contract, that was easier to get a contract. Thus, people, when they come here [Tangier], they find somewhere to live. That's the first thing they are searching for, and the biggest problem is that they don't speak Arabic, they speak Berber. Most people here don't speak Berber. And when people, when they come here [Tangier], and they find no opportunity to go to Europe, they stay here, they marry. They make children. The problem lies rather in the future. When their children grow up, they try to force them to do the things they want, the parents. And in the old days, this worked out good but now these things don't work anymore.
>
> *Interviewer*: Why don't they work anymore?
>
> *Zakaria*: Why don't they work anymore? Now, young people are getting smarter. They think that love doesn't come after marriage, but that the love comes before marriage. As it depends on the person you marry, for me, for example for myself, I wasn't in love with my wife, until I married her. Only 3-4 years after our marriage, I fell very strong in love. We came in good touch with each other. And those people in love, they believe in life. Like, they don't believe in love, they think something is easy or something...but love sometimes is easy and in the meantime it's hard. It is hard to accept that. If you don't accept this person, you cannot marry him or her, that's a normal thing, and thus people escape from. We were hungry in 1948, the first people who used to come from the Rif mountains to here. It was a year of hunger. They did not find food, they found nothing.
>
> *Interviewer*: How come they did not find food?
>
> *Zakaria*: Because in that time, it hadn't been raining for 7 or 8 years.
>
> *Interviewer*: No rain...
>
> *Zakaria*: It hadn't been raining. And in the Rif, we have these problems. The trees get dry, no water, so, in that time, the Spanish were here, not Morocco, and the first Moroccans used to work with them as slaves, do you understand, but when we got independence from Tangier in, 1961. They start to receive people from Al Hoceima, from Nador, from Oujda, bit by bit, little by little, and they came here, and they created a big community of Riffians. We call it a Riffian community. They got help from the Jewish. It was a very big business here, people you know, stayed in houses (laughs) whatever. And some Jewish people who only spoke Jewish, they only spoke Berber and they made an arrangement with the Jewish, in '61.

As shown through Zakaria's interview excerpt, water-related issues had already resulted in the rural-urban migration of people decades earlier. Years of famine and water scarcity caused people to internally migrate to larger cities to find better opportunities and for survival. Tangier became a destination for internal migrants, searching for a better life, in Europe or Morocco.

An interesting finding that results from the comparison of the accounts of Zakaria and Amine – both internal migrants from Al Hoceima living in Tangier and either aiming to go to or having spent some time in Europe – is the ways in which they relate environmental problems to migration aspirations. In both cases, their individual migration trajectories were not framed in terms of environmental change. Zakaria was young when he migrated and wanted to work in a circus in Germany, while

Amine wanted to escape the worsening political climate in Al Hoceima and search for better opportunities in Tangier and Europe. While both referred to water-related issues, only Zakaria reflected on this on a macro-level and related people's desire to migrate with famine and the lack of rain. This demonstrates how difficult it is to apply this discourse of environmental migration to oneself. This may be because migration is always intertwined with the political, social, and economic context. Hence, individual migration motivations are linked to economic, social, humanitarian, and political reasons (Timmerman et al. 2010, 2014a, b; Van Mol et al. 2018).

At the policy level, it is a lot easier to tie environmental change and migration together. Ben (51 years old male, university degree in geography, works at the municipality of Tinghir, cf. Chap. 5), a local policymaker, easily discusses the relationship between environmental changes in his immediate natural environment and its consequences for migration. Hence, it is also easier to set up adaptation strategies at the policy level or from a distance than at the individual level. In the case of Ben, he set up a project that actively tied together his knowledge of both the changing social and natural environments. He departs from a more holistic approach to deal with environmental change by setting up a project that provides extracurricular activities such as a soccer field, invests in solar panels to cope with the lack of water for agriculture, and uses improved agricultural techniques and organisation to enhance the quality of life of people living in Tinghir and prevent people from migrating to (nearby) larger urban areas. As shown in the following interview extract, he relates the changing natural environment to migration:

> *Ben*: But climate change played and still plays a big role. . . eh. . . it's an out-migration factor. That's because, as I said earlier, here in Tinghir we do not have a lot of trade, we do not have a lot of factories, we do not have a lot of companies. So, there are limited work opportunities and sources to gain money. I did not want to wait. Here, we have a palm tree that will give me 30 kilos of dates or an olive tree that will give me 5 litres of oil or something like that. While we are a family consisting of 5 or 10 people. It's worthless. We cannot live like that with two palm trees or two olive trees. . . So, together with climate change, there is also the change of mentality of the generations. Today's young people do not want to work in agriculture anymore, so they look elsewhere. They go to the big cities of the world, or to Europe. And this problem of climate change is one of the other factors, among the causes that drove many families to leave Tinghir. It's a very interesting factor that played a role – and still plays – because in the areas surrounding Tinghir, there are areas that are affected by desertification and drought. They come here to Tinghir, they settle here in Tinghir and after a while. . . they look elsewhere.

Ben's macro-perspective on social, environmental and economic changes in the province of Tinghir, which is required for his professional position, makes him relate environmental changes to migration. This is especially relevant as it results in setting up a community project and contains the seeds of success to adapt to environmental change within a broader societal context.

6.4 Conclusion

While in recent years policy debates have exploded on the topic of environmental migration and displacement, there is still a large gap in the sociological literature on this topic (cf. Hunter et al. 2015; Van Praag and Timmerman 2019). This chapter aimed to fill the gap in the literature by focusing on the perceived environmental/climatic changes in one's living environment and how this relates to the adaptation strategies developed, such as migration. The findings from this chapter are innovative as they provide insights into the perceived linkages between environmental changes and migration and how this impacts decision-making processes. A better understanding of perceived environmental change in regions highly affected by such changes, ongoing adaptation strategies and decision-making processes is crucial to inform policymakers in order to promote successful adaptation strategies to environmental changes in one's living environment (see also Mertz et al. 2009; Bryan et al. 2009).

In the beginning of this chapter, more insights were given on the perception of environmental risks in general, and how environmental changes and risks are linked to migration in the existing body of literature. Departing from the idea that risks are social constructs that vary across social groups and contexts according to people's perceptions of environmental change (Douglas 1966; Beck 1992; O'Connor et al. 1999; Mertz et al. 2009; Rigby 2016), the data analyses show that few respondents actually referred to 'environmental risks'. Rather, the gradual degradation of the natural environment in Morocco leads to a continuous intertwinement between environmental changes and ongoing societal changes, making it quite difficult to distinguish clearly between the risks related to the environment and those to other societal factors, such as the lack of investments in upgrades to the local economy. Consequently, not everyone who perceives environmental changes will automatically see this as a risk and think of how to alter this natural environment or develop appropriate adaptation strategies. Similar to what has been found in previous studies (Mertz et al. 2009; Bryan et al. 2009; Boillat and Berkes 2013; Jha et al. 2018), environmental changes are noted, but not necessarily linked to the active deployment of adaptation strategies, and certainly not as a sufficient factor to migrate or to aspire to migrate. The immediate relationship with migration seems troubled.

When delving deeper into the ways in which people relate environmental changes and risks to adaptation/risk management strategies, it becomes clear that one's interpretation of environmental changes and knowledge of climate change discourses impacts how people deal with environmental change and think of adaptation strategies, at a local or global level, that could prevent more change or reduce its speed, or deal with environmental change at a societal/community level. For the group of respondents that tied environmental changes to the will of God or to the natural cycle, dealing with the changing natural environment coincides with dealing with everyday hardship and does not necessarily imply any means for individual action that could counteract this change. For the group of respondents that frames environmental changes as part of a larger climate change discourse, the level of

action and the capacities required to deal with such environmental change are often beyond the means of the individual or households, paralyzing people's intentions and capacities to react and develop community-wide adaptation strategies. Thus, when examining the development of adaptation strategies, one should consider the limited resources available of individual households confronted in their daily lives with environmental change as well as their power and ability to set up large-scale community projects.

As to whether migration aspirations or projects are also seen as a potential adaptation strategy for dealing with environmental changes, the direct relationship between environmental change and migration was hardly conceived as such. Rather, respondents mentioned a wide variety of reasons to migrate that mainly stressed economic, family, or political motivations. The results of this chapter indicate that many respondents tend to accept these changes and adapt their standard of living or search for alternative ways to improve their living standards. This also means that if people aspire to migrate, alternative or superior migration reasons are given that trigger their actual decision. In many cases, especially for younger people, this refers to the political or economic context in which they live or is associated with family reasons. Hence, individual linkages between environmental changes and migration aspirations and patterns are often hard to make. From a distant or outsider perspective, it is far easier to connect environmental change with migration, but in most cases, also not applied to one's personal situation. This is also partly due to the distinct sociodemographic characteristics and professional situation of the people who are more aware of these climate change discourses (cf. Chap. 5).

To conclude, the findings of this chapter clearly illustrate the need for co-creation of adaptation strategies between people who are confronted daily with environmental change in their immediate environment and those familiar with climate change discourses who are able to set up large-scale community projects or organise the use of coherent adaptation strategies within one region (e.g. the coherence of water wells to secure water or other forms of water management). Furthermore, in order to make people reflect upon the development of adaptation strategies, policymakers or community workers should coordinate the sensitization of climate change discourses that provide sufficient space for so-called 'alternative' views on these topics to enable all inhabitants to develop their own adaptation strategies and consider this within their community. Finally, such sensitization and coordination from (local) policymakers and community workers could also involve a wider migration strategy in which vulnerable groups also have their place and in which migration could be used as a successful adaptation strategy for dealing with environmental change. In Chap. 7, more in-depth analyses will be presented on the importance of considering local cultures of migration and other migration dynamics in the study of environmental change.

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