Migrant Trajectories in a Context of Environmental Change

Evidence from Ghana and Indonesia

vorgelegt von
M.A.
Usha Ziegelmayer

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Promotionsausschuss:

Vorsitzende: Prof. Dr.-Ing. Angela Million
Gutachterin: Prof. Dr. Felicitas Hillmann
Gutachter: Dr. Ernst Spaan
Gutachterin: Prof. Dr. Silja Klepp

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List of abbreviations

BAPPEDA... Regional Development Planning Agency, Regional Development PLanning Agency
COP..... Conference of the Parties
ECOWAS..... Economic Community of West African States
GCM .....Global Compact for Safe, Orderly and Regular Migration
GIS .....Geographic Information System
GPS..... Global Positioning System
IDR .....Indonesian Rupiah
IOM..... International Organisation for Migration
IPCC .....International Panel on Climate Change
LDCs..... least developed countries
LECZ ..... Low elevation coastal zones
NGOs..... Non-governmental organisations
NRF New Regional Formations -Rapid Environmental Change and Migration in Coastal Regions of Ghana and Indonesia
OECD .....Organisation for Economic Cooperation and Development
SES .....Socio-ecological systems
SIDS .....Small Island Developing States
SLR.....Sea-level rise
SMA..... Semarang Metropolitan Area
SMG .....Semarang
UK..... United Kingdom
UNEP.....United Nations Environment Program
UNHCR..... United Nations High Commissioner for Refugees
UNICEF .....United Nation Children's Emergency Fund
US..... United States of America

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1. Introduction

This dissertation is part of the research project “New Regional Formations – Rapid Environmental Change and Migration in Coastal Regions of Ghana and Indonesia” (NRF).[1] It aimed to question the broad assumption that in times of climate and environmental change millions of people would be forced to leave their place of origin in search for a better life elsewhere, especially in the direction of Europe. Analysing two case studies in coastal Ghana and Indonesia, the hypothesis of this dissertation is twofold: Firstly, that the majority of migration in contexts of environmental change is not directed towards the Global North or other far-away destinations but rather occurs within the respective country or region. Secondly, that environmental change alone rarely “causes” migration directly but is rather part of a context specific set of factors influencing migration and mobility. Migration in our globalised world is part of everyday life for more and more people. Recent figures indicate that more than 68.5 million people were forcibly displaced worldwide by the end of 2017 (UNHCR United Nations High Commissioner for Refugees, 2018).

In this context of increasing global (forced) migration, the question of what is driving these migration movements is being widely discussed in both academia and the mainstream media alike. Besides violent conflicts, wars, and poverty as reasons for migration, a new factor was introduced to the debate in the 1990s: environmental or climate change.

In the 1990s, Myers and Kent predicted that there would be up to 200 million “environmental refugees” in the near future. (Myers and Kent, 1995) This estimation led to a twofold reaction. On the one hand, subsequent studies predicted high numbers of refugees or migrants due to environmental and climate change. (Christian Aid, 2007; Missirian and Schlenker, 2017) A study by Geisler and Currens (2017) estimates that by 2100 the number of climate migrants as a result of rising sea levels could reach 2 billion. On the other hand, critics mostly from within academia that questioned these high predictions argued instead that the link between migration and environmental and climate change is not as mono-causal as Myers and Kent suppose. (Black et al., 2008; Castles, 2002; Fritz, 2010; Morrissey, 2012; Tacoli, 2009; Warner et al., 2015; Warner, K., C. Ehrhart, A. de Sherbinin and S. Adamo, 2009) This questioning of the presumption that

[1] The research project “New Regional Formations – Rapid Environmental Change and Migration in Coastal Regions of Ghana and Indonesia” (NRF) was funded by the Volkswagen Foundation. The project consortium was coordinated by the University of Bremen (lead) and the Leibniz-Institute on Society and Space (IRS) in Erkner near Berlin. The overall project is divided into five subprojects, which were run by the ZMT (Leibniz Centre for Tropical Marine Ecology, Bremen), the Jacobs University (Bremen), and the Institute for Advanced Study in the Humanities (KWI) in Essen from 2014–2016. The results presented here were gathered within subproject 3, entitled “Migrant trajectories”, at IRS Erkner. The author wants to express her gratitude for the generous funding of the Volkswagen Foundation. The responsibility for the content of this publication lies with the author.

greater climate and environmental change leads to an increase in mass migration movements, however, remains a rather academic debate.

In the mainstream media the discourse is one of a direct link from climate change to mass migration. In May 2017, an article in the German newspaper DIE ZEIT, entitled "Climate change: displaced by storms" ("*Klimawandel: Von Stürmen vertrieben*"), (Pinzler, 2017), argued that those people who would be forced to migrate as a result of climate change would outnumber migration caused by war. In November 2017 Oxfam published a report entitled "Uprooted by Climate Change – responding to the growing risk of displacement" (Richards and Bradshaw, 2017). A New York Times article in July 2020 titles "The Great Climate Migration Has Begun" reporting on migrations from Latin and Central America to the United States. (Lustgarten, 2020)[2] and acknowledging that climate change is not only a reality in the Global South but a global phenomenon affecting also the Global North and its lifestyle.

These two positions on the relationship between environmental changes and migration set the context for this doctoral dissertation. Suhrke refers to these two perspectives as the "maximalist and minimalist approach" (Suhrke, 1994). The former "tend[s] to extract the environmental variable from a cluster of causes and proclaim[s] the associated out-migration to be a direct result of environmental degradation" (ibid: 477). The latter recognises that "migration, like other social processes, is not a mono-causal phenomenon. […] Environmental degradation by itself is not an important cause of migration, nor can it be quantified easily […] to isolate the relative weight of individual variables." (ibid.)

As stated above, in public discourse the maximalist approach gained increasing attention. Understanding the link between environmental change and migration in a linear and mono-causal way often comes with assumptions of mass migration due to environmental and climate change. Furthermore, this approach has given rise to a variety of blurred definitions and terminologies of the so-called *environmental/climate migrants/refugees*. In a context of growing security concerns linked to migration, (Herbeck and Flitner, 2010) state that this presumed growth in migrant or refugee numbers due to environmental changes is often perceived as a threat, especially for the Global North, where migrants supposedly head to.[3]

[2] This is the first article of a series on so-called global climate migration by ProPublica and The New York Times Magazine. The second contribution is "How Climate Migration Will Reshape America. Millions will be displaced. Where will they go?" available at https://www.nytimes.com/interactive/2020/09/15/magazine/climate-crisis-migration-america.html

[3] This paragraph is based on Ziegelmayer et al. (2019).

Based on two case studies from coastal areas in Ghana and Indonesia where people have been experiencing environmental changes and migration for decades, this dissertation aims at conceptualising the interplay of environmental change and migration. These two coastal regions serve as case studies for this research for several reasons. Due to geographical, historical, and social contexts, coastal regions all over the world represent important nodes in local, regional, and international migration regimes. Moreover, due to colonial history political and economic capitals are often located in coastal areas and thus symbolise important destination and transit zones for migration movements and function as an important junction between internal and international migration.[4] Recent research on Ewe diaspora identifies environmental change in South eastern Ghana as one reason for internal migration which later became international. This research highlights that by now environmental change is an important motivation for the Ewe diaspora to engage in development activities in their region of origin. (Hillmann et al., 2020) [5]

Environmental change also affects and is materialised in various ways in coastal regions. For example, rising sea levels, coastal erosion linked to salinization, mangrove deforestation and depletion, and land subsidence are all well-known phenomena in coastal regions worldwide. In order to understand the interplay between migration and environmental change beyond the dichotomy of mass migration due to environmental change on the one hand and multi-causal linkages between both phenomena on the other hand, the NRF research project selected two coastal regions as study areas: Keta in Ghana and Semarang in Indonesia. Both countries are known for their long history of migration – internally as well as internationally – and have for a long time been affected by environmental changes. Moreover, the two regions have experienced long-term human influences on the coastal areas, both in the form of human settlements but also in bigger infrastructure projects (for example a dam and a sea defence in Keta and the reclamation of eroded land and deforestation in Semarang). Finally, Ghana and Indonesia have both been colonized by the Netherlands which explains among others the integration of both countries into international migration regimes today and which resulted in detailed documentation of environmental change in the coastal areas where colonial settlements were founded and from where the rest of the colonies was exploited. These case studies, therefore, allow for a better understanding of the interplay of environmental changes and migration.

[4] For the theoretical debate on the relation of internal and international migration see King et al. (2008); King and Skeldon (2010); Skeldon (2018) For a focus on internal and international migration in Africa, see Adepojou (2006), for Asia, see Skeldon (2006).
[5] Hillmann et al. 2020 was part of the NRF research project focusing on the Ghanaian diaspora in the US and Germany.

Embedded into the migration and everyday life experiences of many regions over several generations, migration and mobility has been influenced by political and economic developments, social and cultural linkages and networks, as well as narratives of migration like the migration saga of the Anlo-Ewe in southern Ghana or the migration of (Ewe) fishermen along the West-African coastline since generations.

In a context of increasing stress due to environmental changes like coastal erosion, flooding, land subsidence, and severe storms, one can assume that the affected populations would leave those areas and migrate to safer places. As mentioned above, in the debate on migration and climate change, this presumed link between environmental changes and migration has sometimes been fuelled by horrendous figures of so-called climate refugees. Migration studies, however, strengthens our assessment of the multi-causal and multi-directional character of migration and mobility. Migration rarely has just a single contributing factor and migration trajectories do not consist of a simple and linear A-to-B movement from one location of origin to another location of destination but rather exhibit a multitude of movements, factors, and actors influencing each other that are always embedded in and interlinked within certain contexts.[6]

These opposed positions on the relevance of environmental and climate change for migration movements are partly linked to the difference of perspectives from environmental versus migration studies. The paper entitled “Environmental Studies and Migration” (Ziegelmayer et al., 2019) – chapter 2 of this dissertation – serves as a literature review presenting state-of-the-art research in both environmental studies and migration studies. The authors present the historic development of research on migration and environmental change in the two disciplines and underline that different units of analysis and time perspectives are applied by the two disciplines. Furthermore, they highlight that research from the Global South or multi-disciplinary approaches integrate historic dimensions of migration and the relevance of translocal spaces.

Calling for a regional perspective in research on environmental change and migration “because mono-causal explanations are not sufficient for sketching the complex picture of the interrelation between environmental change and migration” (Ziegelmayer et al., 2019), this paper sets the context for the following research questions of this dissertation.

[6] Abu et al. (2013); Black et al. (2008);; Morrissey (2012); Tacoli (2009); van der Geest, Kees (2011); Anwar and Sur (2020); Warner et al. (2015).

1.1 Research questions

Using the concept of migrant trajectories (Hillmann and Spaan, 2017; Schapendonk, 2012), this dissertation analyses how existing migration paths – paths in the geographical and figurative sense – are transformed in contexts of environmental changes and how those two phenomena are interlinked.

The main research questions of this dissertation are:

- What are current migrant trajectories in the two study regions (Keta in Ghana; Semarang in Indonesia) and how do they change as a result of environmental changes in the coastal areas?
- Does migration increasingly serve as an adaptation strategy to risks such as coastal erosion and flooding, or does it occur independently from environmental changes?

This leads to three more detailed questions:

- Which actors (individuals and institutions) and factors influence migrant trajectories in both regions?
- what is the perception of the effects on migration among the remaining local population? How does the local population perceive the ongoing environmental changes and how do they deal with them? (Are they perceived as threats one has to flee from or to fight against, or are they perceived as having been for a long time part of daily life?)

1.2 Papers of this dissertation

This dissertation consists of four papers. The first one being the above-mentioned overview on environmental studies and migration:

Ziegelmayer U, Herbeck J and Hillmann F (2019) Environmental Studies and Migration. In: Inglis C, Li W and Khadria B (eds) *SAGE Handbook of International Migration*: Sage Publications Ltd, pp. 88–107. (accepted manuscript, final version available at https://uk.sagepub.com/en-gb/eur/node/96739/#contents)

Introduction

This contribution to the *SAGE Handbook of International Migration* serves as the literature review for this cumulative dissertation.

Abstract

For about two decades environmental change and migration are a growing concern for political and academic debates. Following the historic development of environmental studies and migration studies, this paper offers a summary of the interaction of those two research fields. While early migration scholars already integrated climatic and environmental factors in their analyses, the nexus had lost its importance until the early 1990s. In the accelerating debates on climate change, it was not only scholars but also international Non-Governmental Organisations (NGOs) and the International Panel on Climate Change (IPCC) that brought environmental change back into migration studies. The debate is nevertheless characterised by blurred terminologies, the mixing of various scales of observation, and a high degree of politicisation. In environmental studies, migration gained greater attention because of projections of future mass migration due to environmental changes post the 1990s. These projections remain contested and this paper calls for a regional perspective on the environmental change–migration nexus in order to integrate the migration experiences of affected regions as well as (short distance/internal)

The second paper is Hillmann F and Ziegelmayer U (2016) Environmental change and migration in coastal regions: examples from Ghana and Indonesia. *DIE ERDE – Journal of the Geographical Society of Berlin* 147(2): 119–138. (accepted manuscript, final version available at https://doi.org/10.12854/erde-147-9)

This second paper is based mainly on a literature review on both study areas as well as a household survey on environmental change and migration in Keta and Semarang. It answers the following research questions:

- How did and do people in Ghana and Indonesia perceive climate change and environmental threats?
- Which coping and adaptation strategies did or do they adopt concerning mobility and immobility?
- Which narrations go alongside the observable patterns of migration and mobility?

Abstract

Coastal regions worldwide have been focal points for migration as well as being affected by long-term environmental changes. In the debate on climate change and migration, coastal regions are among the "hot spot" areas that are supposed to be prone to "climate migration" in the near future. The paper analyses the situation in two different regional settings and advocates for a sound regional perspective on the relationship between environmental change and migration. Based on the conceptual framework of migrant trajectories, the paper shows how populations in Keta (Ghana) and Semarang (Indonesia), affected by similar environmental changes such as flooding and erosion, react quite differently in terms of migration and mobility. The regional perspective, as well as each region's past experiences with migration and environmental changes, is crucial in order to understand current reactions to environmental degradation. The Keta setting represents a typology that pronounces migration trajectories as part of long-standing interregional and international migration; the Semarang setting, however, may be classified as a typical modernisation-induced migration scheme, linked to rapidly growing urbanisation, with "trapped populations" on the one hand and in-migration of migrant workers

These two papers presenting a general literature review and an initial analysis of the situation in both study regions were completed with two other papers – one focusing on the Ghanaian and the other focussing on the Indonesian case study.

The third paper of this dissertation is the chapter: Ziegelmayer U and Spaan E (2018) Migrant trajectories within the context of demographic, socio-economic, and environmental change: Evidence from coastal Ghana. In: Hillmann F, van Naerssen T and Spaan E (eds) *Trajectories and Imaginaries in Migration: The Migrant Actor in Transnational Space*. Abingdon, Oxon, New York: Routledge, pp. 34–55. (accepted manuscript, final version available at https://www.taylorfrancis.com/chapters/edit/10.4324/9781351119665-3/migrant-trajectories-within-context-demographic-socio-economic-environmental-change-usha-ziegelmayer-ernst-spaan)

Abstract

This case study in a coastal area of south-eastern Ghana analyses a region that has experienced migration and mobility for generations and has been at the same time affected by socio-economic and environmental changes for decades. In this context, migration is part of everyday life and is deeply embedded into local and regional knowledge systems. It materialises through contacts with those who have migrated already and is kept alive by those who still aspire to move. Thus, migration is simultaneously a reaction to socio-economic change and environmental threats and a motor of social change, for example return migration contributing to local development.

Combining quantitative data from a household survey with qualitative data from the study area of Keta, we analyse migrant trajectories in this context of social-economic and environmental change. How does social change, for example economic and political decline and environmental change, translate into migrant trajectories? What is the role of "traditional" forms of migration and how do regional mobility regimes come into play? By combining a life course perspective with the concept of migrant trajectories, we aim to elucidate the role of different factors bearing on migration decisions and migrant trajectories,

This work combines the migrant trajectory concept with a life-course perspective (Kou et al., 2015; Kulu and Milewski, 2007) in order to understand how households and individuals in Keta (Ghana) react to environmental changes in their coastal area with regards to migration. Based on the analysis of family genealogies, with a focus on migration histories, this paper aims to identify major types of migrant trajectories at the nexus of environmental change and migration. Specific research questions this paper analyses are:

- How does social change, for example economic and political decline, translate into migrant trajectories?
- What is the role of "traditional" forms of migration, and how do regional mobility regimes and environmental change come into play?

The fourth paper of this dissertation concentrates on the Indonesian case study and is based on qualitative interviews and the above-mentioned household survey: Ziegelmayer U (2018) „Semarang is like sugar": on the complex relation of environmental change and migration. *artec-paper* (220), (accepted manuscript, final version available at https://www.uni-bremen.de/fileadmin/user_upload/sites/artec/Publikationen/artec_Paper/220_paper.pdf)

[published in journal]

Abstract

The Semarang case study serves as an example of the complex interplay of environmental change and migration in coastal areas. Despite various environmental changes and problems in the coastal city of Central Java, Semarang City is characterized by more in-migration than out-migration and therefore makes questionable the direct link between environmental changes leading to out-migration. Based on qualitative interviews in the coastal areas, this paper analyses why in Semarang – as a case of slow-onset environmental changes like erosion, sea level rise (SLR), salinization, and land subsidence – people do not leave in big numbers. On the contrary, some people move but often not very far or only temporarily, while others stay, and a third group of people even migrates into those coastal areas affected by environmental changes. With its more than 1.5 million inhabitants, the city of Semarang serves as an example how urbanisation mechanisms interplay with environmental change and mobility. The paper differentiates between "in situ adaptation" – either voluntarily or in a situation of "trapped populations" – internal migration within Semarang, and in-migration to Semarang's coastal areas despite environmental problems.

This fourth paper of this dissertation focuses on the following research questions:

- How do coastal populations in Indonesia deal with the consequences of climate change?
- Being affected by various environmental changes, who moves from and who stays in coastal Semarang and why?
- How is selectivity of migration in Semarang influenced by environmental change and what are other influencing factors?
- Given the massive environmental changes in the region of Semarang and the manifold nature of these changes, which patterns of in-migration can be identified and how can they be explained?

1.3 Definitions and terms

This dissertation uses the term "environmental change" rather than "climate change" and seeks to understand the nexus between migration and environmental change. This choice of terminology, despite a blurred variety of terms and definitions of "environmental refugee" (El-Hinnawi, 1985; Jacobson, 1988; Myers, 1993)Hugo "climate refugee" (Biermann and Boas, 2008) "ecomigration" (Wood, 2001), "environmentally induced migration" (Hugo, 2008c), and others, takes into account the conceptual and practical difficulty in separating climate-specific factors

from other – anthropogenic or "natural" – environmental changes. Therefore, I decided to look at the broader nexus of environmental changes and migration including, for example, the consequences of huge infrastructure projects or the cutting down of mangrove forests in coastal areas.

In order to conceptualise migration, this dissertation uses the concept of "migrant trajectories"[7] Migration here is seen as a non-linear process, that is, "one form of social and spatial organization in regional settings that are under stress, i.e. environmental stress" (Hillmann and Ziegelmayer, 2016) integrating all periods of migration from departure and transit to reorientation and arrival. Referring to van der Velde we understand migrant "trajectories as spatial routes connecting place of origin and places of desired destination constrain or facilitate the movement of the actor in space." (van der Velde, Martin, 2008: 117). I however explicitly conceptualize migrant trajectories not only as trajectories crossing national borders as van der Velde does, but also referring to internal migration. The individual migrant is conceptualised as part of a field of knowledge and perception. (Carr, 2005) Referring to Carr's work on migration and environmental change in Ghana, I understand power relations as an integral part of migrant trajectories. Carr argues that the way migrants interpret and perceive their environment and the world around them is (re)produced by power relations. Within these power relations, migrants are active agents negotiating and transforming their context and acting according to their perception of migration and environmental changes. Including the perception of migration and environmental change – as well as the migrants' sense of their own vulnerability – into the analysis of trajectories implies integrating the migration history and experience of individuals, households, and communities, as well as myths and narratives around migration.

By "myths around migration", I understand legends and myths around a historical past of migration as it is the case with the migration saga of the Anlo-Ewe in Southeastern Ghana. (Kumassah, 2009) Those myths as well as individual and collective experiences and history of migration within the respective region shape current narratives and perceptions of migration.

1.4 Methodology

This doctoral dissertation is part of the multidisciplinary research project "New Regional Formations – Rapid Environmental Change in Coastal Regions of Ghana and Indonesia" (NRF). As stated in the ERDE contribution (Hillmann and Ziegelmayer, 2016), the two study areas were

[7] For further literature on the concept of "migrant trajectories", see Schapendonk (2012); Spaan and Hillmann (2013); van der Velde, Martin and van Naerssen (2007a); van Naerssen and van der Velde, Martin (2007); Vaittinen (2014).

selected because of their long history of both migration and environmental change. Both areas have been affected by flooding, coastal erosion, sea-level rise (SLR), and salinization; additionally, Semarang suffers from land subsidence. Both countries equally show high population dynamics and are part of international migration networks. The aim of this dissertation, however, is not a one-to-one comparison of the two case studies. Despite their similarities, they are different in terms of population numbers, migration history, and urbanisation dynamics. Instead, I have sought to construct the two cases in order to better understand the complex interrelation of environmental changes and migration. It is important to note that "[w]e deliberately turn away from a conceptual approach that sees […] environmental change as a root cause for migration" (Hillmann and Ziegelmayer, 2016: 125).

I followed a mixed-method approach with "between-method triangulation" (Denzin, 1989). According to Cresswell, "Mixed methods research is a research design (or methodology) in which the researcher collects, analyses, and mixes (integrates or connects) both quantitative and qualitative data in a single study or a multiphase program of inquiry." (Johnson et al., 2007: 119) I opted for mixing a quantitative and qualitative approach at the stage of developing the research design, data collection and the analysis whereby "connection involves one approach [qualitative in our research] being built upon the findings of the other approach [quantitative]" (Halcomb, 2019). I used the mixed-methods approach in order to answer the research question in more depth than applying only quantitative or qualitative methods respectively. (ibd.) In this dissertation, the fairly representative sample of households available for the survey in the study areas provided important quantitative information on the nexus of migration and environmental change. The criteria for household selection (see below) were developed based on prior explorative interviews and the survey was followed by semi-structured interviews with selected survey households. A quantitative approach alone would not have allowed me to understand underlying perceptions and social and cultural understandings of migration and environmental change whereas the qualitative approach is enriched especially in the analysis by the triangulation with quantitative data. Applying this mixed-method approach, this dissertation combines a literature review, census data from Indonesia and Ghana, and a quantitative household survey conducted in both study regions with qualitative, semi-structured interviews in both regions.

An initial literature review was undertaken (Ziegelmayer et al., 2019), as well as explorative research with initial expert interviews in 2014 at both Ghanaian and Indonesian study sites.[8]

[8] The data was collected during two field trips to Ghana in 2014 (2 months) and 2015–2016 (4 months), and two field trips to Indonesia in 2014 (1.5 months) and 2015 (3 months).

Based on this information, a household survey was conducted in both regions in order to provide quantitative data on migration dynamics and environmental changes. I developed the questionnaire for this survey in collaboration with other members of the NRF research consortium and I was responsible for conducting the household survey in Semarang in December 2014[9]. In Semarang, 333 households were interviewed and 274 in Keta.[10]

This dissertation conceptualises "'migrants' as persons who leave their household for more than three consecutive months in order to live in another place, at least another sub-district (Ind.: kecamatan) of Semarang City or another community of Keta Municipality respectively or further away." (Hillmann and Ziegelmayer, 2016). This rather narrow definition of "migrant" in terms of time span and geographical distance was chosen explicitly in order to be able to capture short-distance as well as short term migration. The initial literature review as well as the explorative research mentioned above had shown the importance of these movements in both study regions.

Ghana – Keta Municipality

The seven communities where the survey was conducted were selected following a purposive stratified random sampling (Teddlie and Yu, 2007), using the following criteria in order to cover as many characteristics of the municipality as possible:

1. area of resettlement
2. sea-defence versus non-sea-defence
3. Hierarchical degree/functional hierarchy following the categories of the Keta-Municipality report (I–IV);[11] this hierarchy includes population size, number of functions provided by each community, and centrality score.
4. Livelihood/industries/profile (Salt-mining, agriculture (cash-crop (shallots)), fishing)
5. Spiritual centre
6. lagoon-side versus sea-side

Table 1: Selection criteria for survey communities in Keta

No	Name of the community	Crit 1	Crit 2	Crit 3	Crit 4	Crit 5	Crit 6
1.	Kedzi	X	Sea-defence	III			Sea-side

[9] Errata corrige: in Hillmann and Ziegelmayer (2016) it was wrongly stated that the survey in Indonesia was done in 2015 and the one in Ghana in 2016. The Indonesia survey however was done in December 2014 and the Ghana one in January 2015. The survey in Ghana was conducted by Jan Schuster (KWI Essen).
[10] The respondents were composed as follows: Keta, 58 % male-headed, 42 % female-headed households, representing 1,345 household members (47 % male, 53 % female); Semarang, 82 % male-headed, 18 % female-headed households representing 1,417 household members (48 % male, 52 % female).
[11] See "Hierarchy of Settlements" in Keta Municipality .

				Effect of erosion, migrant community			
2.	Keta		Sea-defence	I	fishing		Sea-side
3.	Tegbi		no sea defence	I	Coconut production		Sea-side
4.	Anloga		no sea-defence	I Shallots cash-crops	big market	spiritual centre	Sea-side
5.	Anlo-Afiadenyigba		no sea defence	II bags Salt mining	weaving		Lagoon-side
6.	Genui		no sea-defence	IV			Lagoon-side
7.	Blekusu		East of sea-defence	No hierarchy	fishing		Sea-side

The seven selected communities are located in different parts of Keta Municipality, as Figure 1 shows:

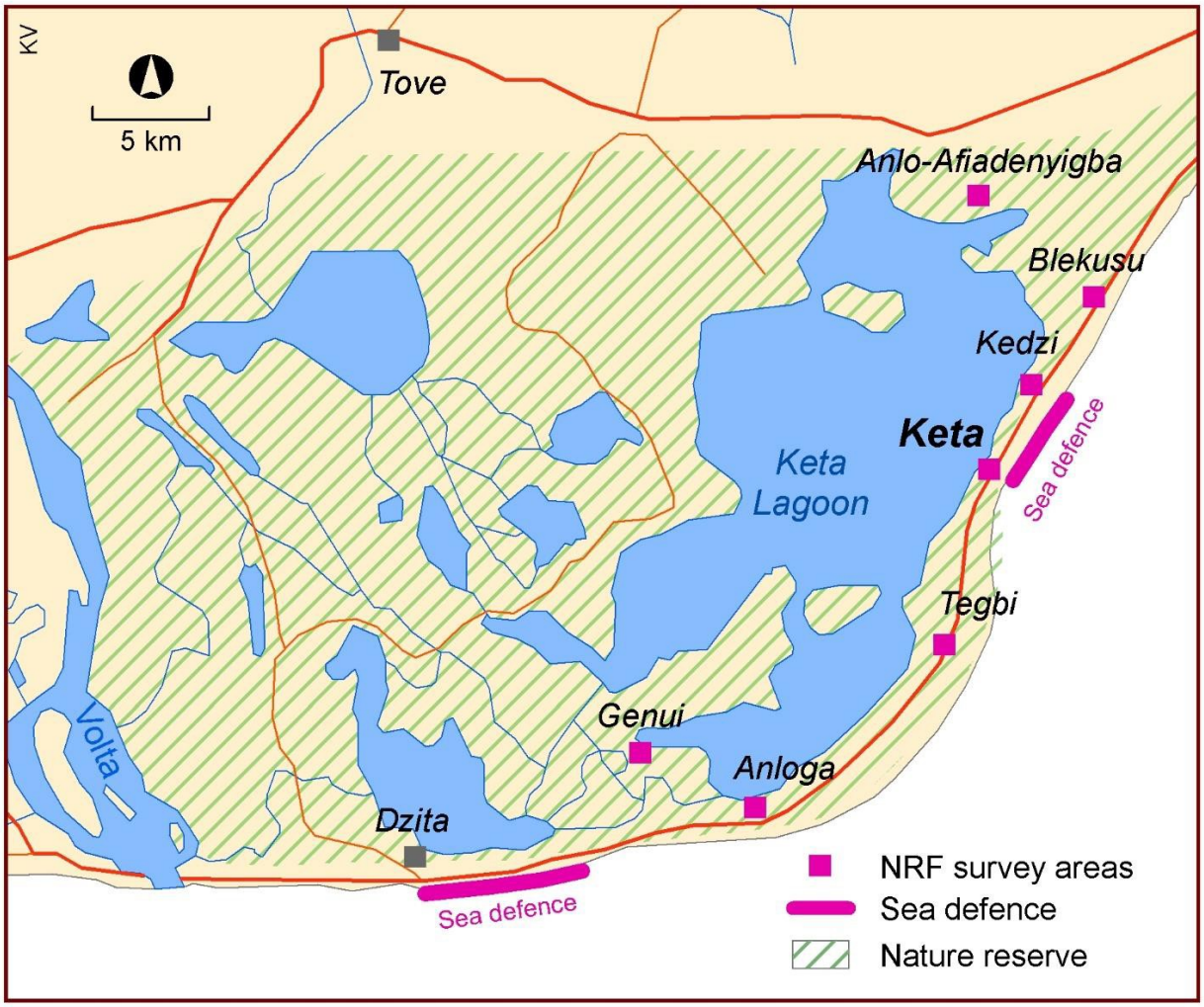

Figure 1: Map study site Keta (Design: Ziegelmayer and Hillmann, Graph: Kartographieverbund TU Berlin, 2016)

The households interviewed for the survey in those selected communities were chosen by random selection. In order to assure this random selection, the research assistants conducting the survey started randomly with one household in the selected communities and from there on continued with every x. household until they reached the needed number of interviewed households per community.

Indonesia – Semarang:

The selection of *kelurahan*[12] for the Indonesian case study was equally done by purposive stratified random sampling. First, seven *kecamatan* – the same number as in the Ghanaian sample – were selected based on environmental-change criteria (tidal floods, river flooding, land subsidence, landslides, drought) and migration data.[13] This selection was purposively done in order to integrate all coastal *kecamatan* affected by mangrove depletion and reforestation, land subsidence, and flooding. The selection of the four coastal *kecamatan*[14] was supplemented by three inland *kecamatan* experiencing flash floods from the river in the rainy season and landslides due to an excessive transformation of forests into settlement areas (Semarang Timur, Semarang Tengah, Tembalang). As for the migration data, the sample integrated as well *kecamatan* with high levels of documented out-migration as well as some with high in-migration. In a second step, within those selected *kecamatan*, fifteen *kelurahan* were purposively selected on the basis of migration data and GIS data on environmental change (flood, land subsidence),[15] as well as on information from initial interviews with heads of *kecamatan* and *kelurahan.* The final selection of the households to be interviewed was conducted randomly using GIS data with ArcGIS, which randomly created the needed number of GPS coordinates in each *kelurahan* for the interviews.

The NRF survey conceptualises "'migrants' as persons who leave their household for more than three consecutive months in order to live in another place, at least another sub-district (Ind.: *kecamatan*) of Semarang City or another community of Keta Municipality respectively or further away." (Hillmann and Ziegelmayer, 2016). The survey was conducted with the head of the household who was asked to provide information about all current and previous household members. The NRF household surveys provide quantitative data on the demographic characteristics of the populations under analysis: their household assets, socio-economic status, and experience of migration and environmental changes. The data gathered through the household surveys was analysed using SPSS software.

In addition to the quantitative data collected by the author and the research consortium, census data from 2010 was obtained for both countries. The data was analysed focusing on the study area in order to integrate the broader context of population dynamics in the region into the

[12] *Kelurahan* is an administrative sub-division in Indonesian cities that represent "urban communities". Semarang City consists of 16 *kecamatan* (sub-district) and 177 *kelurahan*.
[13] The data for this selection is based on the 2010 census data;; "Semarang in Figures 2012" (Bappeda Kota Semarang and Badan Pusat Statistik Kota Semarang (2013) and on BPS (Badan Pusat Statistik) publications on the different *Kecamatan* in figures 2014.
[14] Tugu, Semarang Barat, Semarang Utara, and Genuk.
[15] Helmi et al. (2014b).

analysis. The quantitative data was analysed and presented in Hillmann and Ziegelmayer (2016) and served as important background information for further qualitative, semi-structured interviews with selected households, experts, and key informants in both regions.

In Ghana, qualitative interviews were conducted with selected households from the survey sample (n=29). First, three communities from the NRF sample were selected for semi-structured interviews using the following criteria covering various aspects of the nexus between environmental change and migration:

1. Kedzi (n=09)
   1.1. Community with most migrants in relation to the number of households interviewed in the community (Kedzi and Keta).
   1.2. Community with the second highest number of households with out-migrants in relation to the number of households interviewed in the community.
   1.3. The community with the highest number of international migrants in relation to the number of households interviewed.
   1.4. Community with the highest number of households who moved to their current residence because of environmental change (Kedzi and Keta).
   1.5. Resettlement area.
2. Keta (n=09)
   2.1. Community with the highest number of households who moved to their current residence because of environmental change (Kedzi and Keta).
   2.2. Community with the third highest number of households with out-migrants in relation to the number of households interviewed in the community.
   2.3. Community with the second highest number of international migrants.
   2.4. Political and administrative centre of the municipality (Keta).
3. Blekusu (n=09)
   3.1. Community with the second highest number of migrants in relation to the number of households interviewed in the community.
   3.2. No sea-defence but affected by sea-defence in Keta.
   3.3. According to previous key informant interviews, some “development chiefs”[16] in the community.

[16] With the term “development chiefs”, the respondents referred to migrants from Blekusu who obtained the role of a chief for the community because of their migration experience and continued living abroad without being member of a traditional chief family. Those chiefs are expected to use their contacts and resources abroad for the development of the community in Blekusu.

These 27 selected households from three communities were later complemented with two (n=02) interviews from the NRF sample conducted in Anloga, as several respondents in this community stressed the importance of salt-water intrusion into the fields as one environmental challenge.

Following the snowballing method, seven (n=07) other households with several migrants among their members were interviewed in Keta and Kedzi. The household interviews in Keta served as a starting point for interviews with their relatives (n=24) that had migrated to Accra, Ho (the regional capital of the Volta Region) or to neighbouring Togo. In order to integrate the broader context of migration and environmental change in addition to the migrants' perspectives, traditional and state authorities were interviewed as key informants (n=19) in Keta Municipality using semi-structured interviews.

Following the findings of the 2014 explorative study, as well as the household survey indicating a long migration history in the Keta area, the second period of field research in Ghana undertaken in 2015 - 2016 concentrated its interviews on household histories. I worked with 19 respondents out of nine different households on establishing household genealogies with a focus on the migration history of the respective households.

Those semi-structured interviews aiming at drawing household genealogies were conducted with the head of each household and where possible other household members, including migrants. Completing several interviews per household and combining them into one genealogy allowed for the integration of as many perspectives as possible on family migration histories. In terms of methodology, this approach consisted in a multi-sited research endeavour[17] inspired by Schapendonk's (2013) "trajectory ethnography" whereby I followed some of the migrants on their journey from Keta to either the capital Accra or Ho (capital of the Volta Region). As Büscher et al. (2011) stressed with their edited volume "Mobile Methods" ten years ago, research on migration and mobility today needs mobile research designs. Wherever possible within this doctoral research, I therefore not only did interviews at the place of origin of migrants but broadened the scope of the research from Semarang to Jakarta and from Keta to Ho, Lomé and Accra following contacts provided by the respondents.

Technically speaking, I drew the genealogies on paper during the interviews and later copied them into Excel files with the aim of identifying similarities and differences between the various

[17] For more information on multi-sited ethnography see Falzon (2016).

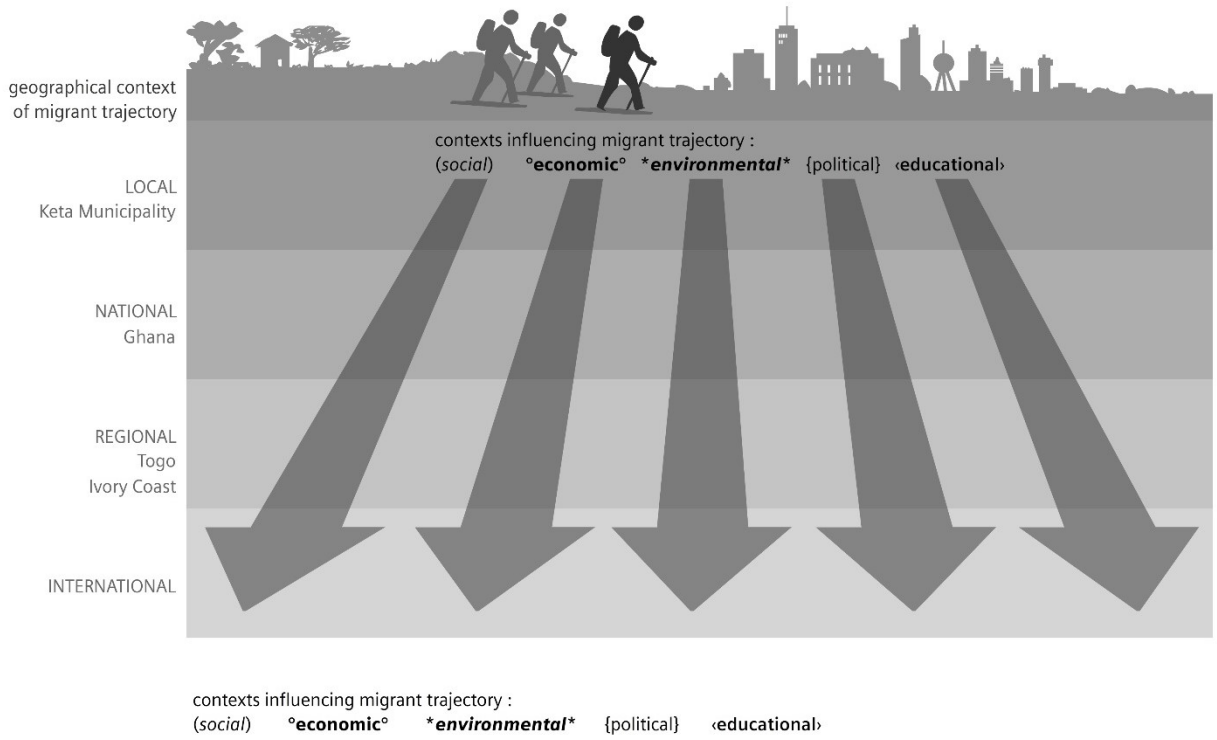

Figure 2: Analytical framework of migrant trajectories embedded in household histories; Source: Concept by Ziegelmayer and Spaan, Design by Piller.

migrant trajectories. These genealogies served as a basis to develop the framework for different contexts (geographic, social, economic, environmental, political, and educational) influencing migrant trajectories (Figure 2).

Research in Semarang consisted of the above mentioned quantitative NRF household survey conducted in 2014 and in 2015, qualitative interviews with selected households chosen out of this sample and key informants like local authorities and academic experts. While the household survey is mainly analysed in Hillmann and Ziegelmayer (2016), the qualitative interviews in Indonesia constitute the primary data on which Ziegelmayer (2018) is based.

These qualitative semi-structured interviews were conducted with migrant households in Semarang (n=26), as well as migrants from other places living in Semarang (n=16), and experts (n=09)[18].

[18] The experts interviewed were researchers from the department of Anthropology at Diponegoro University in Semarang working on migration in Semarang, as well as representatives of the city administration working on adaptation measures to climate change in Semarang.

The fifteen *kelurahan* in Semarang City chosen for the household survey were selected among those most affected by environmental changes and those characterised by high in- and out-migration according to the 2010 census.[19] Within those *kelurahan*, three were selected for the qualitative interviews: Rejosari, Panggung Lor, and Tanjung Mas. This selection was based on high in- and out-migration according to the NRF survey and a relatively high prevalence of tidal and river flooding. The households for the qualitative interviews were selected from the survey sample based on the migration experience of the household as a whole and its individual members. In addition to household interviews in these three *kelurahan*, interviews were conducted with households that had moved away from these *kelurahan* to another area of Semarang (n=08).[20]

The qualitative data from the interviews was analysed using qualitative content analysis, mainly with deductive coding (Mayring, 2000) derived from the different topics in the interview guidelines. However, during the coding process some new aspects arose and were added as inductive codes.

1.4.1 Critical Remarks on methodology

Following the presentation of the mixed methods approach applied in this dissertation, I would like to share some critical remarks on methodology and my own role as a researcher in this project as well as difficulties encountered in the field.

First, one major challenge in migration research in general is to find reliable data on population movements – especially in countries of the Global South. This holds even truer for internal migration within one country and short-distance mobility that showed to be a major phenomenon in my research.[21] Many migrations are not documented. Therefore, the data from census as well as the Indonesian Kecamatan Offices only represent part of the picture and there are probably more people who move below radar level. Those who might have left the study area before the

[19] The data for this selection is based on the 2010 census data (; "Semarang in Figures 2012" (Bappeda Kota Semarang and Badan Pusat Statistik Kota Semarang (2013) and on BPS (Badan Pusat Statistik) publications on the different *Kecamatan* in figures 2014.

[20] As during the field research many respondents stated that people had left their *kelurahan* due to environmental changes but were not able/willing to give out contacts of those people, the migration data at the *kelurahan* offices in Rejosari, Panggung Lor, and Tanjung Mas were analysed in order to identify the *kecamatan* to which most people had moved. Following this analysis, five households were selected in the *kecamatan* and accounted for most migrants by *kelurahan* (from Panggung Lor to Semarang Barat, from Rejosari to Pedurungan, and from Tanjung Mas to Genuk). These interviews are referred to as "migrant HH within SMG".

[21] The Global Migration Group (2017) as part of the Global Knowledge Partnership on Migration and Development (KNOMAD) published in 2017 a "Handbook for Improving the Production and Use of Migration Data for Development" as a response to several declarations on the international level deploring the absence of reliable and comparable migration data.

field research post another challenge to our data. Another weakness in the data collection is thatI could not identify and interview any households that had moved permanently from Keta (because of environmental change or other reasons).

Second, I speak neither Ewe nor Bahasa Indonesia fluently and therefore language constituted a major challenge of access to and understanding in the field as well as for data analysis. In the Ghanaian context, the majority of the interviews were conducted in English, which represented a foreign language for me as well as the interviewees. Especially in the Indonesian contexts where only few interviewees spoke English fluently, I had to rely on research assistants for translation during the interviews as well as for transcription and translation of the interview transcripts.

However the question of “hierarchies of language power” (Temple and Young, 2004: 162) persists with English (interview language) and German (my mother tongue) being on a higher hierarchy level than Bahasa Indonesia, Ewe or Twi (mother tongue of respondents). As Casanova and Mose (2017) state “language is intimately connected to power dynamics in the field” with English often being the dominant language. Despite discussions with the translators on their interpretation of the collected data, the researcher is not a neutral and objective actor in the process of data analysis and knowledge production but “views the data through the lens of [his/her] own knowledge and experience” (Keene, 2020). Temple and Young stress that research in multi-lingual settings, as it is the case with this doctoral dissertation, needs to take into account that “people using different languages may construct different ways of seeing social life. The relationships between languages and researchers, translators and the people they seek to represent are as crucial as issues of which word is best in a sentence in a language.” (Temple and Young, 2004: 164) Temple and Young furthermore underline that “No one can be sure of which concepts or words differ in meaning across languages and which do not, or if this matters in the context of the translation.” (Temple and Young, 2004: 165) In order to minimize the impact of these challenges of translation, I learned some basic Ewe and Bahasa Indonesia to be able to start simple conversations before calling for the interpreter to translate questions that were more complex during the interview. The choice of the interview language was always up to the respondent. This choice of language by the respondents and my own effort to learn at least basic Ewe and Bahasa were important signs of respect for the communities researched and helped to develop trust between me as the researcher, my research assistants an translators as well as the interviewees. (Vanner, 2015) I also discussed the questionnaire for the survey as well as the interview guideline for the semi-structured interviews in detail with the research assistants beforehand in order to assure the most adequate translation of questions and key concepts during

the research process. However, due to limited time and resources, it was unfortunately neither possible to double-check the translated interview transcripts afterwards nor to involve the translators as partners during all phases of the research process from the development of the research design to analysis and interpretation.[22]

Third, my own position as a White researcher from the Global North and as a young tall woman definitely influenced the research process in postcolonial contexts. The term ‘‘postcolonial’’ refers to a previously colonized space that is now technically independent.” (Vanner, 2015: 1) I agree with Vanner’s reflections on positionality and identity of the researcher in postcolonial contexts when she stresses that

> *“There is no neutral or apolitical research (Halse and Honey, 2005; Lather, 1991; Mohanty, 1988). My opinions, values, beliefs, and social background accompany me through the research process, shaping each methodological and analytical decision that I make.” (Vanner, 2015: 3)*

I am a German PhD candidate with a Master’s degree in African studies and several years of experience working and volunteering in the field of civic and political education focusing on postcolonial relationships between Africa and Europe as well as working with migrant organisations in Germany. Despite this academic and professional expertise on Africa, my own formal education has taken place in Germany and my understanding of the data collected during this PhD research, has certainly been influenced by my own social and academic background.

I was an outsider in both study regions and some respondents would certainly have been more willing to speak to someone from their community. At the same time, gender definitely played a role in the research settings and the interaction would have been different if I was a man. In both areas there had been infrastructure projects as well as other research projects with European/Western researchers already, thus the respondents often asked “what they would get back from the interview with me?”. In Keta for example respondents often asked me to help them to get another sea defence, a request which I could not fulfil. This request however calls for what researchers of the postcolonial research paradigm refer to as “reciprocal appropriation” (Chilisa, 2012) meaning that the communities researched as well as the researcher should benefit from a research project.[23] In the case of the NRF research project there was a successful collaboration

[22] Please see Berman and Tyyskä (2011) for a critical discussion on the role of translators in qualitative research projects. The authors call for a reconceptualization of translators as partners during all phases of the research process. Cf. Bashiruddin (2013); Larkin et al. (2007); Temple & Young, 2004.

[23] This reciprocal appropriation” is one of the 4-Rs identified by Chilisa in her book “Indigineous Research Methodologies” (2012). The other Rs are: “relational accountable responsibility”; “respectful representation” and “rights and regulations”.

with researchers from Ghana and Indonesia which led to jointly organised conferences in both Accra (Ghana) and Yogyakarta (Indonesia).

This expectation by some respondents of “getting something back” came along with “research fatigue” (Clark, 2008) which also posed a challenge to the process as both study areas had been objects of various research projects before, especially on environmental and coastal changes, not necessarily migration. This might have led to a certain routine in handling interviews, as was felt by the researcher. Some respondents also seemed to be frustrated answering questions repeatedly without seeing visible changes and improvements for their community.

2. Environmental Studies and Migration[24]

2.1 Introduction

Human activities have always been linked to and influenced by environmental conditions and changes, which has been reflected in population studies from their very beginning. Already in early migration theories, (Ravenstein, E. G., 1885) named climate as an important factor for migration behaviour. After some decades of focusing rather on economic and cultural aspects of the migration process, the interrelation between migration and environment is prominently back on the agenda of migration studies since about two decades now.

This renewed interest in the environment for migration research has also been driven by the accelerating climate change debate and its prominent institutions: already in the early 1990s, the International Panel on Climate Change (International Panel on Climate Change, 1990) mentioned increasing migration as one potential consequence of climate change. And, as a matter of fact, as climate change will continue, environmental problems and degradations like sea-level rise, desertification, rising temperatures, and erratic rainfall pattern will pose major challenges for people worldwide. Recent regional analysis within the (International Panel on Climate Change, 2014) gives evidence that countries of the Global South are most prone to the risks of climate change and – in consequence – environmental degradation. The IPCC Special Report on 1.5°C published in October 2018 reiterates this assumption stating

> *"The most affected people live in low and middle income countries, some of which have already experienced a decline in food security, linked in turn to rising migration and poverty (IPCC, 2012a). Small islands, megacities, coastal regions and high mountain ranges are likewise among the most affected." (International Panel on Climate Change, 2018)*

One strand of literature thus argues that on-going climate change and related environmental degradation will lead to future mass migration movements.

As Hillmann et al. show, the debate on migration and environmental change is characterized by at least three analytical pitfalls: First, the temporality of environmental change influences the debate. Sudden-onset natural hazards like tsunamis or flooding events get great attention by media and research, while slow onset changes such as desertification or contamination remain in the shadow of the debate. Second, the debate is characterized by a wide range of definitions

24 This chapter is the first paper of this cumulative dissertation and is being reprinted with permission from SAGE Publications. It was first printed in the SAGE Handbook of International Migration.
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and blurred terminologies of *environmental migrants*, including *environmental refugees*, *climigrants*, *environmentally displaced persons* and others. Third, the scales of analysis (household/local, regional, national, global) as well as various time scales are often not clarified and mixed up in research projects, with a potential neglect of a (regional) synthetizing perspective.

This contribution first presents a concise overview of environmental studies' engagement with migration. The second section, in contrast, focusses on the importance of environmental change within migration studies. In our conclusions we suggest that a regional perspective could work as a synthetizing analytical lens for an integration of these two fields of knowledge.

2.2 Migration in Environmental Studies

Direct contributions of environmental studies to migration studies have been rather limited. If at all, they can be traced back to very short, selected periods in the discipline's engagement to explain migratory patterns and behaviour.

Still, one of the most cited and maybe most influential works on the role of environmental degradation and migration was published by a biodiversity specialist. In the 1990s Norman Myers and her colleague Jennifer Kent published a book entitled *Environmental Exodus: An Emergent Crisis in the Global Arena* (Myers and Kent, 1995). It received much attention because the authors claimed that in the – then – near future up to 200 million people would be on the move due to environmental change, i.e. "sea-level rise and flooding of many coastal communities, plus agricultural dislocations through droughts and disruption of monsoon and other rainfall systems" (ibid.: 1). The starting point of this and following publications was the fear that anticipated population growth, environmental degradation and poverty would come together in areas that were projected to be especially impacted by changing environmental conditions due to climate change. The authors thereby paid special attention to the projected changes in sea level rise, precipitation patterns and drought periods. Their conclusion was that in the face of growing environmental pressures, those poverty-ridden, malnourished and undereducated populations would flee the areas and seek refuge in other regions or continents. Starting from the assumption of 25 million *environmental refugees* in 1995, he renewed his former projections in 2002 and predicted that the "total number of environmental refugees could well double by the year 2010, and increase steadily for a good while thereafter as growing numbers of impoverished people press ever harder on overloaded environments. When global warming takes hold, there could be as many as 200 million people (…)" (Myers, 2002). A more recent study, either contested, correlates rising temperatures and potential numbers of asylum seekers in Europe and thereby

projects that asylum applications could rise up to 1.01 million per year in 2100 (Missirian and Schlenker, 2017).

The way in which the predictions were produced has been criticized heavily by social scientists and migration scholars and has led to often cited finding of a division of the discourse between maximalists and minimalists (cf. below). Although (Stojanov, 2008) claims a connected and clear disciplinary divide between ecologists, geographers, and environmental experts on the one hand, and migration scholars on the other, contributions to the debate from the environmental sciences are rare. More recent influences of natural sciences can be seen in single contributions that, for example, introduce the concept of socio-ecological systems (SES) to the climate change and migration nexus (Murphy, 2015). In doing so, the author stresses the connections of the vulnerability, resilience and (im)mobilities of populations in areas of multiple ecological stresses, thereby taking a specific stance on environment-demography interactions in Bangladesh and Kiribati. Inspired from the resilience thinking of, for example, ecologists (Gunderson and Holling, 2002) that conceptualize the adaptive capacities of different levels or scales of (eco)systems with the help of an adaptive cycle model, Murphy advocates for integrating this more ecosystem-based approach into researching the connections between migration and environmental changes. In the same vein, he argues that this could help overcoming the strong dichotomy between ‘social’ and ‘natural’ factors that still dominates much of the reasoning in the nexus. SES thinking could then be part of

> *a reinterpretation of ‘nature’ so that it is no longer an exogenous factor dictating the fate of societies nor a distant original state subsumed by modernity, but a dynamic fusion of the social and ecological (…) The adoption of theoretical, methodological and interpretative frameworks informed by SES resilience would hasten the excision of simplistic and deterministic causalities from the study of the climate change–mobility nexus. (Murphy, 2015)*

Other contributions (see for example Neumann and Hilderink, 2015) focus on the use of data for establishing links between records of environmental changes and demographic changes derived from, for example census data and thereby focus strongly on possible statistical interrelations between two data sets. The clear aim of Neumann and Hilderink is to integrate methods and approaches of the environmental studies (for example uncertainty analyses, hind-casts and other simulation techniques, dating methods using quartz and feldspar optically stimulated luminescence etc.) in order to better understand past migration movements and to be able to better simulate expected migration movements in face of environmental changes. When claiming that a “variety of methods originating from disciplines other than those typically applied in migration studies (…) may be beneficial for investigating the relationship between environmental

change and migration" (Neumann and Hilderink, 2015), they clearly target the integration of more sophisticated methods of the environmental studies to refine research methods in the field.

In general, the direct influence of environmental studies on the literature on migration and environmental change is limited to those specific interventions that are, despite the works of Norman Myers, usually not widely adopted. The protagonists of the debate on the interrelation between the environment and migration are mainly to be found among migration scholars, human geographers and population researchers/demographers. Some strands of migration research have been influenced by naturalist or geodeterministic thinking; the inclusion of such explanatory patterns in the theorization of migration reverberates the general reception of natural science approaches on the reasoning across wider disciplinary boundaries, thereby developing subtler influences that scholars have been subject to in earlier phases of migration research.

2.3 Environmental Change in Migration Studies

2.3.1 Overview

Population geography has, for many years, agreed on the role of environmental factors as contributing to the development of civilisations and the formation of cities. (Piguet, 2013) compares the presence of the natural environment in migration studies with the movement of a pendulum, with more or less clear phases of attention, disappearance and reappearance of the environment in the course of the past century. Since the very beginning, migration studies have regarded climatic and/or environmental conditions and changes as part of the factors influencing migration. Early scholars like (Ratzel, 1882) or Ravenstein, E. G. (1885) have included environmental conditions as explanatory factors in their explanations of human migration. Still in the early second half of the 20th century, (Petersen, 1958) acknowledge that ecological circumstances can result in 'primitive migration': when people are no longer able to cope with natural changes, migration serves as one possible strategy out of this situation.

From the 1960s and 70s onwards, the focus of research on migration changed. Migration, being bound mainly to ongoing economic expansion and corresponding recruitment policies in Europe, was explained and analysed basically with the concept of 'push and pull-factors', based on economic theories, e.g. income differences or work opportunities at the places of origin and destination (Todaro, 1976). While economic theories pronounced the relevance of the economic dimensions of migration on the basis of a *rational choice* logic and tended to interpret migration as a reaction to the needs of the labour market, emerging neo-Marxist macro theories (Castles

and Kosack, 1972) pointed to the inherent political dimension of migration for the overall functioning of the labour markets.. Those analyses rarely integrated environmental factors such as environmental degradation into their theorization. Further, the strong in-migration into cities all around the globe led to a prevalence of studies that focused on problems of integration and cultural adaptation.

In addition, from the early 1970s, the Club of Rome report (Meadows, 1972) stimulated far-reaching socio-political debates with regard to the limits of resource exploitation, population dynamics, environmental degradation and pollution. In the course of the following decades, the debates around sustainability introduced considerations of environmental change into a broad array of social and socio-economic processes, among them migration. This contributed to a growing interest in the environment, also among migration scholars, and evoked the emergence of the research field.

Accordingly, a growing literature on migration and environmental change has long been dominated by two opposing perspectives: on the one hand, the “maximalist approach” that “tend[s] to extract the environmental variable from a cluster of causes and proclaim the associated out-migration to be direct result of environmental degradation” (Suhrke, 1994) and, on the other hand, the “minimalist approach” that recognizes that “migration, like other social processes, is not a monocausal phenomenon. […] Environmental degradation *by itself* is not an important cause of migration, nor can it be quantified easily […] to isolate the relative weight of individual variables.” (ibid.)

Especially in public discourses and media accounts, the maximalist approach gained more attention. This mono-causal and linear understanding of the linkage between environmental change and migration often went along with predictions of future mass migration due to environmental and climate change and gave rise to a wide range of blurred definitions and terminologies of so called *environmental/climate migrants/refugees*. Until today, some of those predictions are frequently referred to and have also been contextualized in a wider field of security concerns, when describing those presumed migrants as a security threat, especially for Northern countries where they are believed to head to (Herbeck and Flitner, 2010).

The rejection of mono-causal and simplifying ascriptions of migration movements to changing environmental conditions today is well established and has also been verified in a growing body of empirical studies (Black et al., 2008; Tacoli, 2009; van der Geest, Kees, 2011). Already in 1996, Hugo argued that especially in the least developed countries (LDCs), “the deeper underlying causes of environmental migration are not environmental but rather linked to political, economic,

social and demographic processes." (Hugo, 1996). He thereby also referred to a parallel debate in development studies, namely to the seminal works of (Sen, 1981, 1999) and his entitlement theory to explain the occurrence of famines. Those approaches also found entry into migration research where migration has been conceptualized rather as a result of political factors and decisions than purely environmental ones, and where household level migration decisions and livelihood arrangements came into focus.

Similarly, Castles, an established migration scholar, criticised the mono-causal understanding of the relation of environmental change and migration, underlining the importance of other factors for migration (decisions) even in times of global climate change:

> *the notion of the 'environmental refugee' is misleading and does little to help us understand the complex processes at work in specific situations of impoverishment, conflict and displacement. This does not mean, however, that environmental factors are unimportant in such situations. Rather they are part of complex patterns of multiple causality, in which natural and environmental factors are closely linked to economic, social and political ones. (Castles, 2002: 5)*

More recently, the Foresight Report (Foresight, 2011), a UK government sponsored, influential report stressed that not all populations affected by environmental change would automatically be future *environmental migrants/refugees*. Underlining the agency of affected populations, the Foresight report has pointed towards the high relevance of migration as potential solution to challenges of environmental change in some contexts.

In this context, Hugo (2013) has alluded to the selective character of migration and describes it as only one possible reaction to climate change which is probably not taken by the majority of populations concerned. In his 1.000 pages anthology *Migration and Climate Change* (2013) which gathers many of the most influential writings within the field of environmental change and migration, he also points to the importance of former migration experiences influencing current migration dynamics, if people migrate and where to (ibid. xvff). Hunter adds that the various forms of environmentally induced migration range "across a continuum from forced to voluntary, and that the association between migration and environmental hazards varies by context, hazard type, and household characteristics." (Hunter, 2013) Adamo, focusing on migration in the context of sea level rise and floods, highlights that

> *although mass displacement after a natural disaster event is a common phenomenon, mass migration of the permanent type does not take place to a large extent. […] It seems that migration is highest if damage to housing and infrastructure is combined with reduced income or working opportunities in places where out-migration was already taking place before. (Adamo, 2013)*

Besides this importance of the migration history, Hunter et al. (2017) underline that the connection between environmental change and migration is supposed to be higher where local livelihoods are closely linked to the environment, e.g. where livelihoods are mainly based on agriculture and fisheries. The authors therefore strengthen the need for localized perspectives focusing on the household and its livelihood options. In a similar vein, Tacoli (2011) stresses the importance of the socio-economic context that very much determines the durations and destinations of migrants in face of environmental changes.

Black et al. criticize that currently much of the literature on environment and migration focus on natural disasters and individual migration decisions, thereby underestimating the role of migration as a historicized social phenomenon of "social and demographic interaction and change." (Black et al., 2011a: 2) Referring to e.g. the West African context, other authors stress that migration has been for generations and still is a well-established form of social organisation, as well as a means of societal transformation in many regions being part of traditional mobility patterns (Awumbila et al., 2011). Acknowledging this fact, environmental changes have to be analysed in a broader context of the migration history of the respective region, the socio-cultural and socio-demographic context, the political and economic situation as well as existing narratives of migration and relationship to nature and environment.

In connection to those *cultures of migration*, questions of gender relations also come into focus. For example, Carr (2005) adopts a Foucauldian power/knowledge approach for understanding household reactions to environmental change in central Ghana, arguing already a decade ago that power relations between male and female household members are central to understand migration decisions in the context of changing rainfall patterns.

Later research has confirmed that environmental change as well as migration affect and is experienced by men and women differently. As Sweetman puts it:

> *Any dramatic and unplanned change to the environment will present practical challenges to how people make their livelihoods, and this in turn will challenge or reaffirm women's and men's roles, and power, in their families, communities, and wider society. (Sweetman, 2009: 2)*

Terry, for example has shown that that boat migration by young men from West Africa is partly linked to climate stress affecting local livelihoods especially in rural areas. The socio-cultural contexts put high expectations on (young) men to sustain their families. Therefore, they see themselves forced to migrate in case of environmental decline and loss of livelihoods in order to be able to remit to their families (Terry, 2009). In the context of risk perception studies also show gendered differences: "while men generally perceive less risk than women, once they do perceive

heightened risk, they are more likely to evacuate than women with comparable risk exposure." (Hunter and David, 2009: 17) The authors furthermore state "socially produced gender relations such as caregiving roles, childhood socialization, and clothing norms affect women's ability to survive disaster." (ibid.: 18). It also is clear from those accounts that gender relations are not only important for cultural understandings of migration decisions, but play vital roles in power structures, economic relations and livelihood decisions. Understanding household reactions to environmental changes has therefore to be contextualized within prevailing gender relations in those households.

To sum up, the academic debates on migration and environmental change today agree that the linkages between environmental change and migration are not mono-causal and direct, but have to be analysed in wider and more complex societal contexts. Horror scenarios of future mass migrations across national borders due to natural disasters are rejected by most scholars, but are still regularly referred to in political and media accounts (Bettini, 2013).

2.3.2 Blurred Terminology

The nexus between environmental change and migration has not only been subject to debates in academia, but has been taken up in political circles. There have been numerous interventions on the international level, often trying to get to grips with the existing regulatory frameworks on the national level. From the Cancun framework that puts the focus on migration as adaptation to climate change, to the 2012 COP (Conference of the Parties) in Doha as well as COP 21 in Paris in November 2015, various international summits on climate change took into account migration and displacement. At COP 21, the stakeholders decided to create a task force "to develop recommendations for integrated approaches to avert, minimize and address displacement related to the adverse impacts of climate change." (cited in Martin, 2017). COP 23 with more than twenty events on the nexus of climate change and mobility showed rising awareness of policy makers, scientists and civil society actors alike for this link. From the realm of international environmental and climate change politics the environmental/climate change migration nexus gains more and more attention in international migration policies: The Global Compact for Safe, Orderly and Regular Migration (GCM) which was adapted in December 2018 in Marrakech, Morocco contains a section on "Natural disasters, the adverse effects of climate change, and environmental degradation" *(*Objective 2, paragraphs 19.h-19.l*)*[25]*.* From the very beginning, political interventions have paid great attention to the question of definition and terminology.

[25] Cf. https://environmentalmigration.iom.int/environment-and-climate-change-gcm.

Not only since the much-quoted United Nations Environment Program (UNEP) report by (El-Hinnawi, 1985), the debate on migration and environmental and climate change has also been connected with the question of how this 'new' group of migrants should be labelled and in how far certain labels also suggest rights and resources of the people that fall under it. As a result, some parts of the debates (and some of the labelling attempts) have also been driven by inter- and transnational organizations like the United Nations High Commissioner for Refugees (UNHCR), or the International Organization for Migration (IOM). The first UN-sanctioned mentioning of such a label in the El-Hinnawi (1985) publication used the term *environmental refugees* for a specific type of migrants, assuming that on-going environmental changes would lead to mass movements. In the beginning, the political concern behind this debate was to raise public awareness about environmental issues, while the question of a legal categorization was in the background. Later on, especially UNHCR for a long time strongly opposed including environmental changes in debates on flight and migration (Black, 2001), while IOM published a very broad, virtually all-encompassing definition of *environmentally induced migration*, that has been widely cited and frequently used in the debates. It describes environmental migrants as

> *persons or groups of persons who, for compelling reasons of sudden or progressive changes in the environment that adversely affect their lives or living conditions, are obliged to leave their habitual homes, or choose to do so, either temporarily or permanently, and who move either within their country or abroad. (IOM, 2007)*

As Figure 3 shows, different terms have been used to refer to migration and flight in the context of environmental changes, e.g. *environmental refugee*, *environmental migrant* or *environmentally displaced person*.

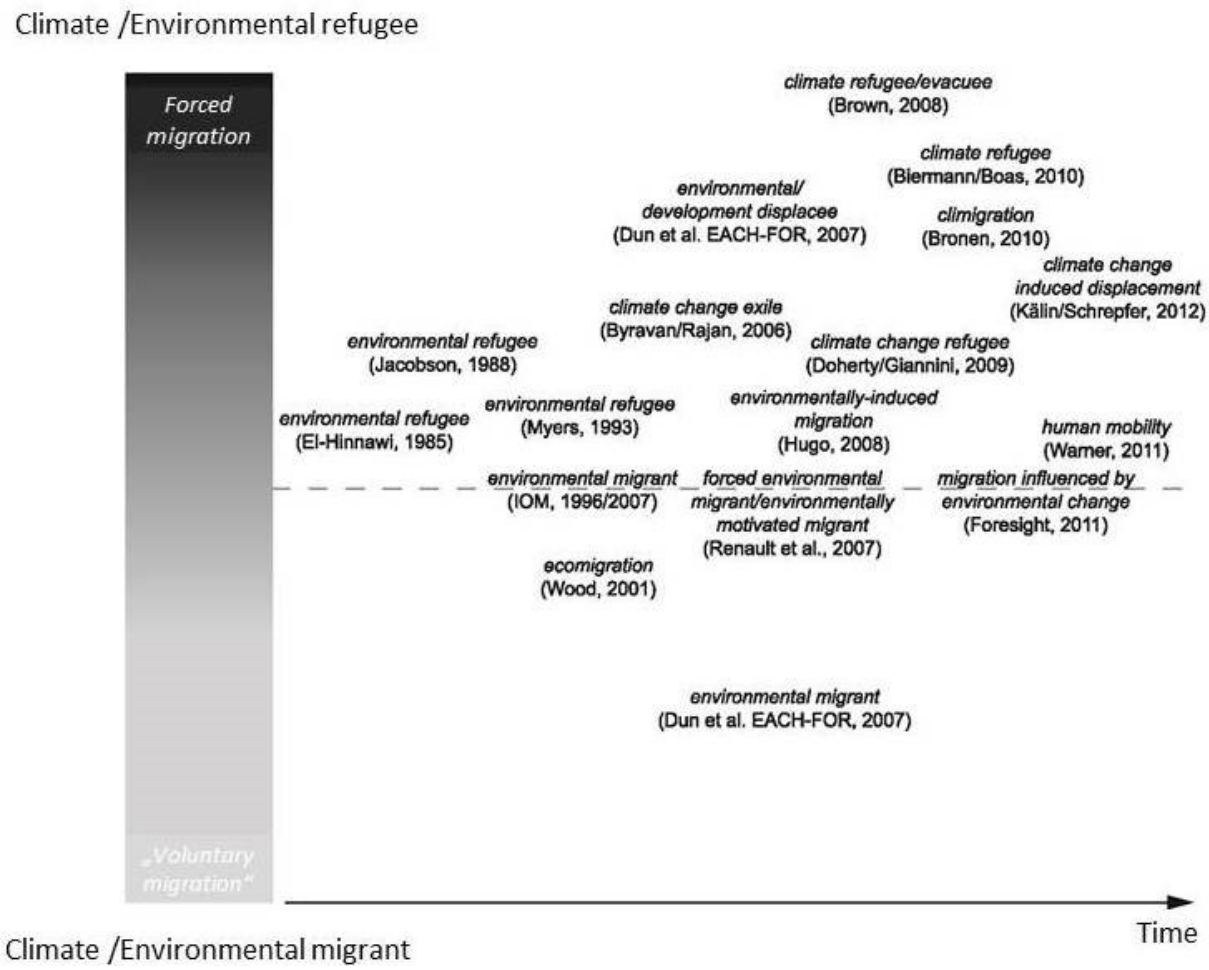

Figure 3: Terminologies over time (taken from Hillmann, 2016: 180, based on Müller et al., 2012)

Those terms inherently refer to two basic differentiations, along which a spectrum of environment-migration relations is often delineated: first, voluntary vs. involuntary migration, often in conjunction with the different forms of slow and rapid onset environmental change; and second, the distance of migration that is expected, especially whether migration due to environmental change is expected to take place within or across national borders.

For example, El Hinnawi (1985) and later Jacobson (1988) differentiated three subtypes of environmental refugees: 1) temporary displacement due to temporary environmental stress, 2) permanent displacement due to permanent environmental change, 3) temporary or permanent displacement due to progressive degradation of the resource base. Other authors differentiate between “emergency vs. slow-onset movements, temporary, extended and permanent movements, and internal and international movements” (IOM/RPG, 1992).

This temporal dimension of different forms of environmental change is shown in Table 2, including the differences between anthropogenic and ‘natural’ environmental changes.

Table 2: Temporal dynamics of environmental changes (Hillmann, 2016: 176)

Environmental Changes		
	Slow onset	*Rapid onset*
Anthropogenic causes	Desertification, soil degeneration, air pollution	Landslides, water crises, contamination (=litter pollution, poisoning, overfishing, deforestation, consequences of infrastructure projects (e.g. dams))
Natural causes	*Slow onset*	*Rapid onset*
Climatic	Sea-level rise; changing rainfall patterns	Droughts, heat waves, floods, cyclones
Tectonic (disaster)		Tsunamis, earth quakes, volcanic eruptions

Reactions in terms of mobility to those various changes or natural disasters differ. Whereas rapid changes and natural disasters like tsunamis often cause temporal displacement of large numbers of people, the interrelation between slow-onset environmental change like desertification or coastal erosion and migration or mobility is more difficult to perceive, analyse and predict. Fernando et al. (2010) however point to the possible continuation of temporary displacement into permanent migration of some people, e.g.in case of hurricane Katrina in 2005 or the tsunami in the Indian Ocean in 2004 (ibid.). Renaud et al. (2011) differentiate between *environmental emergency migrant*, *environmental forced migrant* and *environmental motivated migrant* referring to both the temporal dimensions of environmental changes mentioned above as well as the vulnerability of the populations concerned.

Other authors differentiate along different sources of environmental change, thereby e.g. identifying natural disasters, slow-onset degradation processes and climatic changes; this has been complemented by anthropogenic events like resettlement schemes in development projects or industrial accidents (Trolldalen et al., 1992). IOM has systematized this by adding an overall distinction between natural and man-made causes into their definition of environmentally induced migration (International Organisation for Migration, 1996) thereby stressing the relevance of the often negative consequences of infrastructure and development projects for local populations and their livelihoods as shown in Table 2. In 2000, the World Bank has estimated the number of people being displaced in the context of large-scale development schemes at 10 million people annually (Cernea and McDowell, 2000).

Connected to the question of definition are also far-reaching implications for international law. From the beginning, the political debates have also dealt with the questions whether the existing

legal frameworks for refugee and migrant rights are sufficient. Many voices pointed to the need of an international framework to deal with those potentially emerging forms of migrations, including humanitarian aid for so called *climate refugees* (Biermann and Boas, 2008; Christian Aid, 2007; Docherty and Giannini, 2009; Environmental Justice Foundation, 2009). Connected to this, the debates have often focussed on Small Island Developing States (SIDS) like Tuvalu, Maldives or Kiribati. Here, it is especially the threat of the loss of a complete national territory that has fuelled discussions pushing for solutions in international law (Kelman, 2015).

The terminology of *climate* or *environmental refugees* is a delicate issue. Until today, there is no legal recognition of environmental change as a root cause of migration and the protection of people fleeing environmental or climate changes is limited. Despite the usage of the term *environmental/climate refugee* those groups are not included in the 1951 UN refugee convention (Geneva Convention). This convention only covers persons who leave their country “having a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion.” (Geneva Convention, 1951) As Piguet stresses, “it is clear that environmental motives are absent from this list and that most displacements happen internally, within internationally recognised borders.”. So-called *environmental/climate refugee* cannot benefit from humanitarian assistance and protection under the Geneva Convention. The Kampala Convention by the African Union (2009) extends its definitions of internally displaced persons (not refugees) to those “who have been forced or obliged to flee or leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or **natural or human-made disasters**, and who have not crossed an internationally recognized State border.“ (African Union, 2009). Recent attempts to establish a legal category or an international institution concerned with persons displaced by environmental change have been driven by the Swiss-led *Nansen Initiative* and its successor, the *Platform on Disaster Displacement*, for example advocating for the integration of respective paragraphs into the United Nation’s Global Compact on Migration (Platform on Disaster Displacement, 2018).

This shows that the political and economic dimension of the problem is closely linked to global power relations – and as a key feature of a highly politicized discourse on migration (Baldwin, 2013; Herbeck, 2015; Hillmann et al., 2015; Klepp and Herbeck, 2016) . Baldwin (2013) makes a complementary argument when stating that the climate change-migration discourse and especially the figure of the climate change migrant is inherently racialized.

In contrast to the countries in the Global South, industrialized countries are assumed to have the economic capacities to adapt more easily to climate change in order for their populations to be able to stay at their place of living, for example at the coast. These differences in vulnerability and capacities to adapt to climate change clearly show that the question of migration in a changing climate is always political. Who has the capacities to move, who actually wants to move and who is responsible for environmental degradation due to climate change? Whose interest is it and who has the means to assist populations for example in coastal regions prone to erosion and flooding? Those questions are even more important when considering debates around multiple global inequalities in connection both to post-colonial thought and in the climate change discussions (cf. (Gesing et al., 2014). In this line of thinking, economic inequalities are then also understood as being the result of centuries of unfair economic and political relations between countries in the Global North and their colonies. As a direct outcome of decades of resource extraction, political destabilization and exploitation of labour force, the economic disparities that are at the centre of many migration theories themselves are the object of political struggles and contestation, seeing displacement as a consequence of extractive capitalism (Sassen, 2014). Similarly, climate change is regarded as a historic by-product of the industrialized economies, with 'Western' countries being responsible for the largest parts of culminated greenhouse gas emission that cause climatic changes impacting mainly regions in the Global South. Those aspects are connected in claims of global solidarity and climate justice, for example by activists of a global climate movement (cf. Dietz and Garrelts, 2014; Parks and Roberts, 2010), in which positions range from de-growth to green-growth scenarios. At the same time, the question of an adaptation fund or a similar mechanism to support the areas and countries most affected has been one of the earlier claims.

High estimations of future *environmental migrants/refugees*

In line with a mainly mono-causal understanding of the relation of environmental/climate change and migration in the beginning, and with the aim to raise public awareness on environmental issues, one of the first and widely cited authors presenting estimations about the quantitative dimension of this group of migrants, was the above mentioned Norman Myers (1993). The debate gained attention among international non-governmental organizations (NGOs) who themselves more and more influenced the public discourse with their own studies and estimations of future *environmental migrants*. Estimations of climate change related migration for the year 2050 are as high as 200 million (Stern, 2007). The widely cited report by the NGO Christian Aid (2007) even estimated that the number of migrants due to climate change will be pushed to at least 1 billion

by 2050, however, admitting that “there are no recent, authoritative, global figures on the number of people who could be displaced from their homes by climate change” (Christian Aid, 2007: 22).

The way in which the predictions were produced has been criticized heavily by social scientists and migration scholars (cf. above), e.g. Massey et al. who see “many environmentalists tak[ing] as an article of faith that population growth, environmental deterioration, and out-migration are fundamentally interrelated” (Massey et al., 2007). Similarly, Castles argues that the estimations do “not provide figures on people who have actually been displaced by such problems. Rather, the linkage appears simply as ‘common sense’ – if water levels rise, or forests disappear, it seems obvious that people will have to move.” (Castles, 2002: 3) The links between the two phenomenon are, so he argues, much more complex.

Despite this criticism, the predictions have continuously been referred to since their publication and until today are frequently cited in academic discourses, and, even more, in media accounts and political debates around the topic. In some cases, the projected rising numbers of migrants have been used uncritically and presented as horror scenario (Castles, 2002), evoking strong sentiments of fear and anxiety in the potential destination areas. (cf. Chaturvedi and Doyle, 2010) In this context, some authors warned of the risk that these predictions might lead to more “restrictive attitudes towards migration and (…) to a militarization of CM [*climate migrants*]” (Bettini, 2014: 184).

Fernando et al. (2010) acknowledge that estimations are hardly possible when taking the complexity of the interactions between environmental change and local household dynamics seriously. They are further complicated due to the fact that in the initial phase, those migrations are expected to be rather short distance, i.e. internal migration (Fernando et al., 2010).

Box 1: Migration and Environmental Change in Asia and Africa

Asia

Asia is home to some of the most densely populated regions worldwide like Java in Indonesia or the South Asian deltas. Some of those areas are at the same time among the most vulnerable to climate change. However, the connections between environmental change and migration in these places have been studied rarely, which makes it complicated to assess the potential magnitude of this type of displacement (Hugo and Bardsley, 2014). Influences of environmental change on migration in Asia have been documented recently in the context of the reporting efforts of the Nansen Initiative, concentrating on sudden-onset, disaster type events. First results show that from 2008 to 2014, about 30 million people have been displaced due to disaster events in South East Asia alone, with China and the Philippines being the most affected countries (Lavell and Ginnetti, 2014). In the case of slow-onset changes, more

indirect influences of environmental change on migration are likely, via drivers like food security, agriculture and health. In this context of a complex interaction of different drivers, poverty, especially among the rural population, will be one important factor determining how people (can) react to environmental change and whether migration is among their options (Hugo and Bardsley, 2014). A study by the Asian Development Bank (2009) relates the way populations respond to climate change in terms of migration to their respective history of migration and already established networks. The impacts of changing monsoon and cyclone patterns have to be regarded through this lens as well.

While cities might adapt quite effectively to climate change, Hugo and Bardsley (2014) regard poor rural populations in Asia as being most vulnerable to climate change. Rural-urban and rural-rural migration networks are key to understanding and enhancing adaptation mechanisms of vulnerable rural populations in face of climate change. The authors do not doubt that climate change will increase the already highly complex migration patterns in Asia.

Africa

Climate change predictions for Africa estimate a temperature increase of 3 to 4°C, rainfall predictions differ widely across the continent and e.g. West Africa is said to lose 5 to 7% of its agricultural production in the Sahara and 2 to 4% in West and Central Africa (Boko et al., 2007; IPCC 2012, cited in Morrissey, 2014: 85f). Sea-level rise is predicted to reach between 14 and 44cm (Kundzewicz et al., 2007) with the West African coast being the most vulnerable because of the large populations living in low-elevation coastal zones (LECZ) and large population growth expected in these areas (Neumann and Hilderink, 2015).

Migration is a well-known strategy across the continent shaped by history and representing one possible response to environmental stress for a long time already in West Africa (cf. Afifi, 2011; Doevenspeck, 2011; Hampshire, 2002). Circular migration in this context appears to be a “privileged response to livelihood stress” because of its flexibility to adapt to changes in rural and urban economy (Morrissey, 2014). Based on a review of 13 case studies on migration and environmental change in the West African Sahel, (Jónsson, 2010) also argues that in the case of drought, environmental change does not forcibly induce migration. Environmental stress might on the contrary limit resources which would be needed, especially for international or long-distance migration (Jónsson, 2010). Hillmann and Ziegelmayer (2016) further point to the dominance of internal migration prior to international migratory pattern.

2.3.3 Migration as adaptation

As sketched above, migration is often used as one of several livelihood strategies to adapt to environmental change. This has been intensively discussed in the field of development studies and has been connected with the buzz phrase of ‘migration as adaptation’. Laczko and Piguet

(2014) underline that not all migration in a context of environmental change is to be considered as forced displacement:

> *Even when confronted with severe environmental push factors, people and communities are resilient and have some degree of control over their decision to migrate or to choose other adaption strategies. Some people, for example, may choose to migrate to avoid the impact of environmental change and therefore have time to plan their move. Others may decide to move temporarily, while the environmental situation is poor. In this sense, migration can become a way of adapting to climate change, for some people, rather than being viewed merely as a problem. (Laczko and Piguet, 2014: 2)*

The 'migration as adaptation' debate is, comparable to the above mentioned difficulties of the debate on environmental change and migration, highly politicised and characterised by blurred definitions. The concepts discussed – vulnerability, coping capacity, risk and resilience – are highly contested (Arnall et al., 2014; Bassett and Fogelman, 2013; Taylor, 2014) differentiate three adaptation concepts: 'adjustment', 'reformist' and 'transformative' adaptation (for a comprehensive summary of other typologies see, for example Biagini et al. (2014). Adjustment adaptation defines vulnerability as mainly caused by climate change. In this perspective, vulnerability is not seen as a consequence of socio-political causes, excluding (unequal) power relations favouring or hindering migration, but as a consequence of climate change. Therefore, solutions are mostly technical and in a top-down manner, e.g. via the construction of coastal protection measures (Hillmann et al., 2015).

In this context of technical features of adaptation to climate change, resettlement or relocation programs and other forms of governed migration management, with often massive negative consequences for affected populations at stake.

The second concept, reformist adaptation, perceives vulnerability as caused mainly by an interplay of social and biophysical causes and therefore tries to respond to climate change within the institutional, political and technical realm. It does not go that far though as to challenge inequality and vulnerability by its causes from within the system. Within the third concept, transformative adaptation, vulnerability aspects are addressed by identifying and resolving their causal structures and processes across dimensions, spatial scales and social hierarchies within the political and social realm. This last concept often challenges social systems fundamentally and asks for radical changes. Vulnerability here is more than just vulnerability to climate/environmental change. It is summarized as a "multidimensional state of being-at-risk, as produced and reproduced on multiple scales and encompassing such aspects as rights and entitlements, unequal positions in society and inequalities in the distribution and access to resources, power and decision making, and others" (Hillmann et al. 2015: 6f). Within the concept

of transformative adaptation migration is just one aspect of a multidimensional transformation process of living conditions in a context characterised by environmental change.

Coming from the tradition of vulnerability studies, the concept of social resilience (Adger, 2000; Keck and Sakdapolrak, 2013; Obrist et al., 2010) combines the concepts of coping and adaptive and transformative capacity. 'Coping' capacity encompasses reactive activities dealing with the consequences of a risk or shock. Further, 'adaptation' denotes proactive activities in order to adjust livelihoods and reduce vulnerability by learning from past experiences in order to anticipate future risks. Keck and Sakdapolrak (2013) define 'transformational' capacity as the ability to decrease vulnerability by introducing positive changes in the socio-political and institutional arena. Cutter et al. define "social vulnerability" as Using the hazards-of-place model of vulnerability, we suggest that social vulnerability is "a multidimensional concept that helps to identify those characteristics and experiences of communities (and individuals) that enable them to respond to and recover from environmental hazards." (Cutter et al., 2003: 257). The authors however do not allude to the importance of migration.

A related aspect is introduced by the concept of 'translocal resilience' which does not focus on possible causal links between climate change and migration but underlines the important role " of translocal linkages (understood as the multiple connectivities between people and places, involving networks, identities and flows of resources and ideas) for vulnerability and resilience" (Hillmann et al. 2015: 7; see also Sakdapolrak 2014). A translocal perspective can then help to understand how varying forms of vulnerabilities and capabilities at different places are tied to more or less resilient livelihood strategies of translocal households. This has also been applied to situations of environmental change and hazard in various case studies (cf. Greiner and Sakdapolrak, 2013; Islam and Herbeck, 2013; Scheffran et al., 2012). The concept of translocal resilience serves as an example how, on the one hand concepts from migration studies and on the other hand concepts of vulnerability and resilience studies can merge together: well established concepts in migration studies, e.g. transnational linkages, migrant strategies and trajectories (Spaan and Hillmann, 2013), are then related to concepts of vulnerability and resilience from development studies.

2.4 Concluding remarks: migration and environmental studies

This chapter seeks to identify the interrelation between environmental change and migration within the two academic fields of environmental research and migration studies. Our reflection highlights that the two fields of study tend to concentrate on different units of analysis and on

different time perspectives. While migration studies rather tend to put the migrant him or herself into the centre of research, environmental studies rather point to social groups and on livelihood conditions. While environmental studies sometimes prefer to work with future scenarios of possible migration movements due to environmental change, migration studies rather tend to focus on existing migration movements also including the historical dimension. This chapter also shows that the environment has been out of focus in migration studies in the Global North especially in those years that were dominated by economic expansion – with the exception of the Club of Rome publication and its subsequent debates that brought the topic back to migration studies. Our literature review also reveals that studies from the developing countries themselves or those ones adopting a multi-disciplinary approach towards the explanation of migration are more inclined to take into account historical migration patterns or the emergence of translocal spaces.

Three analytical pitfalls seem to dominate the current debate: a blurred terminology – especially concerning the term of the refugee, not being backed by the Geneva Convention, a mixing of various scales of observation and a high degree of politicization. On one hand, this politicization is needed to generate public attention for the accelerated environmental degradation in many places of the world in order to strengthen alliances to prevent further climate change and related environmental degradation. On the other hand, this alarmist perspective might lead to an underestimation of the relevance of political, social and economic constraints that determine the quantity and quality of migratory flows. Overall, migration research seems to be reluctant to interpret environmental change as a root cause for migration. Some research more and more emphasises the role of (im)mobility regimes as localized outcomes of global inequalities.

While the majority of the literature highlights the situation of people that migrate in the context of environmental change, a substantial share of the population that cannot or does not want to move, exists. An increasing body of literature puts emphasis on those populations who cannot move because of lack of resources, the so called “trapped populations” (Black and Collyer, 2014). The blurred debate in different aspects might call for the importance of a regional perspective because mono-causal explanations are not sufficient for sketching the complex picture of the interrelation between environmental change and migration. The regional lens would allow for a conscious integration of influencing factors such as the migration history or existing migration networks as well as also perceptions and narrations on environmental change and migration. As most migration in the context of environmental change takes place inside the country or in the geographically close region respectively, a focus on the regional dimension promises to integrate

migration into its context in terms of risks, already established adaptations mechanisms as well as probable future scenarios.

3. Environmental change and migration in coastal regions: examples from Ghana and Indonesia[26]

3.1 Introduction

All over the world, coastal regions are known to be deeply entangled with regional migration regimes and with population dynamics more in general. At the same time, coastal areas are today in the very focus of environmental change such as sea level rise, coastal erosion, salinization, land subsidence as well as the depletion of mangroves.

This article investigates the relationship between mobility patterns and environmental change in two coastal areas that have experienced environmental change since many decades and have been subject to a variety of adaptation programs and technologies: Keta in Southeastern Ghana and Semarang City in Central Java (Indonesia). Both places are well documented in the scientific literature and promise to function as showcases for the larger debate on the relationship between environmental change and migration, but might not be regarded as truly representative cases. The chosen regions are distant from each other. But they show a variety of common traits that make a comparison attractive.

The two regional examples have been selected exactly for their since long existing history of environmental change and migration. Both cases illustrate the increasing role of human impacts in coastal regions on ecosystems and the feedbacks of environmental change on urban areas and populations, especially in terms of mobility and migration. Because they have been experiencing an active integration into regional migration systems for a long time, they possibly also allow for a more detailed and sound analysis of the presumed interrelations of migration and environmental change. In contrast to many studies in the field, our research does not refer to the projections or the potentials of environmental or climatic change, but it deliberately focusses on two regions in which massive environmental changes have already occurred over the last decades ("rapid change"). This methodological approach meets our research interest best, because it allows also for the observation of the political and discursive processing such as narratives within the normative setting of the region over time.

[26] This chapter is the second paper of this dissertation: Hillmann F and Ziegelmayer U (2016) Environmental change and migration in coastal regions: examples from Ghana and Indonesia. *DIE ERDE – Journal of the Geographical Society of Berlin* 147(2): 119–138.

This article presents the first results of an empirical study that has been conducted in 2014/15. It echoes the interpretation of stories that have been told for long by scientists, local experts and migrants themselves about these regions. How did and do people in Ghana and Indonesia perceive climate change and environmental threats themselves, which coping and adaptation strategies did or do they adopt concerning mobility and immobility? Which narrations go along with the observable patterns of migration and mobility?

The article is organized along six sections: after this introduction, we first summarize the main traits of the debate on environmental change and migration and then introduce the conceptual framework of migration trajectories, an emergent field within migration studies. Built on this, we present the main trends and pattern of migration and mobility in the two selected countries in a nutshell and then highlight the main environmental changes over the past years. Section three gives an insight into the used set of methodologies. Section four presents the first preliminary results of the empirical work we have undertaken. The fifth section discusses the results in the light of theory and the presented literature review. The paper concludes by highlighting the main outcomes and by identifying lacunas for future research.

3.2 State of the art: Migration and Environmental Change

The question as to whether and how climate change affects human mobility has been widely debated both within the policy context and in academia. (Afifi and Jäger, 2010; Gemenne, 2010; Piguet et al., 2011) produced seminal edited volumes, Hugo (2013) presented a 1000-page best-of reader on the conceptual debate, and the Foresight-Report (2011) has guided the policy-debate.

2014 was being reported as the warmest year since 1880 (National Aeronautics and Space Administration, 2015). This fact confirmed what the IPCC-report (IPCC, 2013) put forward as its main message on the dynamics of climate change: the warming of the climate system is unequivocal, and the changes are unprecedented in recent millennia. The effects of these changes in the climate are expected to increase the likelihood of internal and international migration through increased frequencies of droughts and floods, desertification, salinization of soils, coastal erosion (due to sea-level rise), more storms and extreme weather events and competition for scarce resources (Martin, 2012). The threat of climate change and environmental degradation on collective resources such as fresh water, land and agriculture is enormous and will increase in the near future. Unscrupulous exploitation of natural resources such as the extraction of oil and metals – regardless of ecological risks – additionally challenge climatic

variations (Klein, 2014). High pressure on natural resources is further provoked by rapid demographic growth in many places in the world and an increasingly extractive global economy adds to the culmination of environmental crisis in many parts of the world (Sassen, 2014).

The debate on the nexus of climate change and migration already began in the 1990s. The questions as to when a decision to move is taken, and whether and under what circumstances a tipping-point for migration is reached, is among the hottest topics within this debate, accompanied by estimates and speculation about the numbers of future migrants. The question on the quantitative dimension is rather easy to answer when concentrating on the effects of sudden climate events, such as thunderstorms and heavy rains that create devastating circumstances and threaten local livelihoods, especially in low-lying coastal areas. The annual number of newly internally displaced people as a result of natural disasters oscillated between 31.7 million people in 2010 and 22 million people in 2013 (IOM, 2014). When it comes to slow-onset environmental change the question on the dimension and the dynamics of migration is far more difficult to answer. Longitudinal studies are lacking and up to today the process of decision-making itself remains a black box within many migration studies. The nexus between environmental change and migration and mobility is not straightforward, but filtered by a variety of more general developmental issues (cf. Black, 2001; Black et al., 2011b; Tacoli, 2011).

The current debate is best characterized by three analytical pitfalls: an extremely high degree of politicization, a blurred terminology and a missing spatial differentiation and conflation of various levels of analysis, i.e. global, national and local (Hillmann et al., 2015). Some authors also claim that the blurred terminology refers to the field itself because it is thought to be constructed strongly communicatively. The authors claim that, in many cases the distinction, which factors are perceived to be environmental ones and decisive for migration depends very much on the perspective applied. In many cases, the discourse and the narrative going along with migration and environmental change, might be more influential for migration decisions than the actual environmental changes themselves (Aufenvenne and Felgentreff, 2013).

3.2.1 Theoretical framework: migrant trajectories

Against the background of those pitfalls in the debate, this paper refers to the conceptual approach of migrant trajectories. It considers this concept as one way of bridging the analytical gap between various scales (global, national, local) by embedding migratory action as one form of social and spatial organization in regional settings that are under stress, i.e. environmental stress.

The term migrant trajectory (when referring to migration itself: “migration trajectories”) calls for an analysis of all phases of migration, departure(s), transit(s) and arrival(s). Migration trajectories work “as the collective and "visible" outcome of many individually migrating persons.” (Spaan and Hillmann, 2013: 65) “ and do pronounce the non-linear character of migratory processes, implying “a shift in focus from the individual to a structural view on migration processes by concentrating on the outcome of collective biographical paths or as a repeated spatial arrangement of migrants.” (ibid.). Migrant trajectories are defined as “composed of one or more episodes (change of countries) and one of [sic!] more status (periods of residence in different countries)” (Castagnone, 2011: 4–5). The focus of analysis here is on the process rather than on a single event by an individual in time and space.

Inspired by migration theories like transnationalism, trans- and transit migration and migration networks the concept of migrant trajectories aims at linking (concrete) individual migration projects with (more abstract) migration regimes. This way, a new conceptualization of the migration process is pushed forward – pronouncing the path dependency of migratory action and by taking into account materiality. “Transmigration is, however, not just a trajectory but a multiplicity of potential trajectories” (from an actor’s perspective they may also be described as orientations, scenarios, narratives, projects, maybe options) which are often unstable, always likely to become something else. (Grillo, 2007: 200) – thus pronouncing fluidity and instability. Vaittinen for example stresses the link between the macro-level of collective movements and institutions on the one side and individual human beings on the other side, all related through the migrant trajectory (Vaittinen, 2014) .

As emphasized by van der Velde, Martin and van Naerssen (2007b) and van der Velde, Martin and van Naerssen (2015) migration trajectories refer to spaces of belonging. They take into account geographical and mental distance as well as perception as constituting thresholds for migration in a globalized world, putting emphasis on the existence and importance of “soft” and culturally bounded factors as contributing to the dynamics of migration.

Accordingly, a growing body of literature on the relationship of migration and environmental change in developing countries refers to the influence of existing gender regimes (Awumbila and Tsikata, 2010). Some authors point to existing or changing power relations and, more generally, to phases of immobility (Schapendonk, 2010) during the migration project as contingent of the mobility regime. Fragmented journeys, known as being typical for the movement of refugees (Collyer, 2010), start becoming a normal feature also for regular migratory patterns. The migrant is seen as part of a larger structure, a field of knowledge, of perception and integration. So does

Carr, in his study on environmental change and migration in Central Ghana, bringing in Foucault´s concept of power/knowledge and hereby stressing that the interpretation of the world and the environment is (re)produced by power:

> *Such an approach, however, moves beyond the existing literature by shifting the focus of study from conditions that drive migration […] toward the local power/knowledge in which environment, ecology, and politics are understood. The ways migrants negotiate and transform their context, and the objectives behind such negotiation and transformation, are the condition and result of this understanding. (Carr, 2005: 929)*

Here, power relations constitute an important aspect of migrant trajectories, it admits power of agency to the migrant him- or herself, definitory power over space. Migrant trajectories position the migrant within migration regimes, as fed by migration industries in the respective regions and on different regional scales. A migration regime delineates the „interplay of juridical regulations, the political handling of migration, migration traditions and cultures of migration in different parts of the world" (Hillmann 2016: 160, translated by the authors).

Another 'spatial perspective' in the debate of migration and environmental change is put forward by Black and Collyer (2014). The authors claim that today "trapped populations" exist, people that – out of a lack of resources or other restrictions - are unable to move when confronted with an environmental shock situation. Further, Schapendonk stresses the idea of trajectories as channelling migration, "Migrants' trajectories are not closed-off corridors but open and process-like phenomena. They are influenced by, among others, the trajectories of other people, objects, capital, rules and information." (2012: 32). In this paper we frame "trajectories as spatial routes connecting place of origin and places of desired destination [which] constrain or facilitate the movement of the actor in space." (van der Velde, 2008: 117). Based on the presumption that migration is not entirely based on rational decision-making this article includes purposefully cultural factors like migration myths and narratives into the analysis. According to Abu et al. (2013) it is crucial to understand how people concerned perceive climate hazards and their own vulnerability towards it in order to understand migration decisions in the climate change – migration nexus. In this context the authors, argue that a particular (environmental) event may be perceived as "normal" when it is experienced over a long period and therefore might not push people to migrate.

3.2.2 The relevance of migration in Ghana and Indonesia

As shown above, migration trajectories are rooted within migration regimes. Indeed, in Ghana there is "long history of mobility with migration playing a central role on the livelihood and advancement strategies of both rural and urban populations." (Awumbila et al., 2011: 1; cf.

Manuh, 2001) Due to the colonial history of the country, there is a legacy of internal North-South migration. People migrated first due to “forced migration through labour recruitment.” (van der Geest, Kees, 2011: e72), later then, somewhat more voluntarily, for working in the cocoa plantations in the South. Generally, the European influence through slavery, missionaries and colonialism led to still existing ties between Ghana and the former colonial powers trough business, religious and family ties.

Ghana was a for a long time a net immigration country. Immigrants stemmed from the neighbouring countries and other ECOWAS (Economic Community of West African States) member states, before changing to become a net emigration country in the 1960s. (Awumbila et al., 2011: 1) Nowadays Ghana experiences all types of migration: “internal migration, immigration, transit migration and emigration both within and outside of Africa.” (ibid.) According to Peil (1995) economic decline and the lack of educational and job opportunities led to international out-migration especially by young Ghanaians since the mid-1970s. Just after the country’s independence in 1957, the first president, Kwame Nkrumah, followed a rather liberal immigration policy, but already in 1969 the Aliens Compliance Order was installed and many immigrants were expelled out of Ghana. The oil boom in Nigeria and the economic success of the neighbouring Ivory Coast led to out-migration to those two as well as other ECOWAS member states. In 1979, the ECOWAS installed a Protocol on the Free Movement of People between the respective countries.

Failing economic policies in Ghana led to economic decline and “migration re-emerged as a tried and tested strategy for many Ghanaians” (Manuh, 2001: 19). High skilled migration from Ghana especially took place in the health sector, for example to the US and the UK (Tankwanchi, 2012; Teye et al., 2014) .

Like Ghana Indonesia is highly dynamic in terms of population and migration. As a former Dutch and partly Japanese colony, Indonesia gained independence in 1945 and saw massive forced migration schemes under the dictatorship of Suharto until 1998. From the 1950s to the 1990s Indonesia experienced a steady increase in out-migration. The net-migration rate has always been negative since 1950. Between 2010 and 2015 it was around -0.8 (migrants per thousand inhabitants) (IOM, 2010). Immigrants account for not even 0.1 % of the total population (The World Bank, 2011).

Indonesia today is characterized by strong labour migration to Asian countries, especially Malaysia, and to the Middle East (IOM 2010). These migrations are often chain migrations and the migrants' families strongly support the migration decision in most cases. Half of those Indonesian migrant workers stay abroad illegally and some are confronted to inhuman treatment by their employers (Brown and Brownlee, 2000).

Migration from Indonesia often takes place undocumented (IOM, 2008) with 78 % of labour migrants being female in 2007 (IOM, 2010). Between 1996 and 2007 the number of women migrating overseas has nearly doubled, while the number of male migrants decreased – Saudi Arabia and Malaysia being the top- destinations (Platt et al., 2013). Skilled emigration targets towards the OECD countries, especially to the Netherlands, due to historical colonial ties. A big share of this international migration is organized by agencies as part of the above mentioned migration industry.

In Indonesia's history colonisation and the transmigrasi program were used by the ruling powers in order to prevent social upheaval on the main island Java and to get rid of potential sources of political instability in other areas (Brown and Brownlee, 2000). The so-called transmigrasi program aimed at reducing the number of inhabitants on the main island Java by populating outer islands with Javanese people. First exercised during Dutch colonization from 1905-1941, the second transmigration program was launched after independence in 1950, initiating also voluntary migration (Fearnside, 1997). Many NGOs criticised the program, since it did not reduce population pressure in Java, but rather provoked social and political conflict on the outer islands.

In the recent decades, foreign and national investments in the metropolitan area of Jabotabek (i.e. larger Jakarta), as well as in secondary urban centres like Bandung (West Java) and the study area Semarang (Central Java), have attracted rural populations from Java and other islands (Firman, 2004). Those migratory movements are mostly circular, leading to increasingly diversified income bases of both rural and urban households and reciprocal relationships between sending and receiving areas (Hugo, 2008b). Regarding international migration movements, the Javanese provinces are among the main sending areas of official, registered emigration from Indonesia, mainly to the USA, the Netherlands and the Middle East (Hugo, 2008a; Spaan, 1999). All over Indonesia poverty-reduction rates have not been in tandem with economic growth (Platt et al., 2013) and unemployment rates are significantly higher for women.

Ghana and Indonesia both count a strong diaspora population with 719,404 Ghanaians and nearly 3 million Indonesians living outside their country of origin. The main destination countries are within the region of the respective countries with 47 % of the Ghanaian migrants living in other

African countries, followed by the US (21 %), UK (11 %), Italy (6 %) and Germany (3 %). The Indonesian diaspora is mainly living in Malaysia (35 %), Saudi Arabia (13 %), the United Arab Emirates (11 %), Netherlands (5 %) and the US (4 %) (all figures from (United Nations, Department of Economic and Social Affairs, Population Division, 2013). Both countries show great flows of remittances (The World Bank, 2011) - contributing to local development end reinforcing further migration.

3.2.3 Migration and environmental/climate change in Ghana and Indonesia

In both countries, migration due to environmental changes is not a recent phenomenon. The people in the savannah of West Africa e.g. had to deal with climatic variability and environmental stress for centuries: “Human mobility has a very central place in the adaptive strategies of farmers and pastoralists” (van der Geest, Kees, 2011) and is an “omnipresent characteristic of the livelihoods and culture of northern Ghanaians” (ibid.: e90).

Migration does not necessarily occur immediately after environmental change takes place (cf. Abu, 2011; van der Geest, Kees, 2009, 2010, 2011). But people are very aware of climate related changes. Migration intentions show to be strongly linked to socio-demographic factors like age, sex, education, migration status etc. of the head of the household (Abu et al., 2013). Moreover, seasonal, circular or temporary out-migration patterns are already common where land-dependent residents search for alternative incomes during difficult times and regular movement has become a part of the regional culture (Centre for Migration Studies, University of Ghana, 2011). Migration works as one of numerous strategies of risk diversification, used by households in an environment challenged by climate change (Abu et al., 2013; Kwankye et al., 2009; Yaro, 2010). Abu concludes that rural populations are capable of dealing with just one climate related event at a time, e.g. flood or drought. It generally gets difficult for the resident population when several climate related events occur at one point in time and/or cannot be predicted beforehand (Abu, 2011). Van der Geest shows in his longitudinal analysis that times of great environmental stress in Northern Ghana were rather times of reduced out-migration (van der Geest, 2011a). ”In the late 1980s and in the 1990s, [however,] a time of environmental recovery in northern Ghana, migration increased again.” (ibid.: e89)

Like Ghana, also Indonesia shows a combination of anthropogenic and ‘natural’ environmental change. Increased landslides and flooding are partly caused by the transformation of agricultural or forest land into settlements. According to the World Bank the economically most important

regions of Bali, Java, Sumatra, and Papua are also most vulnerable to climate change (The World Bank, 2010). In a study on province-to-province migration in Indonesia over 15 years, (Bohra-Mishra et al., 2014) claim that climatic variations influence permanent migration, while disasters have smaller or no impacts. The study especially indicates a nonlinear effect of temperature on migration, “such that above 25°C, a rise in temperature is related to an increase in outmigration, potentially through its impact on economic conditions.” (ibid.: 9780) Indonesia’s tropical climate combined with a high dependence on agriculture and a long tradition of interprovincial migration might increase the effect of temperature rise on interprovincial migration (ibid.: 9785).

An UNICEF report on migration and climate change in Indonesia emphasizes that climate change in Indonesia, as well as in many other parts of the world, “is likely to exacerbate and aggravate existing patterns of migration rather than to create new flows.” (Helmi et al., 2014a; Urbano et al., 2011)

As the world’s fourth most populous country and with a population of over 60 % living in coastal areas (Purwaka and Sunoto, 1999) Indonesia is highly vulnerable to climate change. The population density in Java is the highest in the whole country (Handayani and Kumalasari, 2015), which leads to a close interplay of urbanization, population growth, environmental change and migration.

Densely built environments create a “heat islands” effect, while the burning of forest leads to smoke over large areas (UN Habitat, 2010; Urbano et al., 2011). The country is further exposed to geological and climatic hazards like “flooding, landslides, extreme weather events, droughts” (Bohra-Mishra et al., 2014) sea-level rise and changes in temperature at land and at sea. These changes occur as rapid and as slow environmental changes. Due to urbanisation, coastal cities grow rapidly, despite flooding and land subsidence, and more than 25 % of the country’s poor inhabitants live in coastal areas (Handayani and Kumalasari, 2015), which makes them even more vulnerable to climate change (Marfai et al., 2008).

Handayani and Kumalasari (2015) state in a study on Java that out-migration from areas affected by climate changes has not yet been chosen as an adaptation strategy. Coastal cities like Jakarta, Semarang and Surabaya attract migrants despite environmental hazards and local populations show a strong attachment to their domicile. This attachment to place as well as the dependence on the sea for their livelihoods and the closeness to industrial zones as working place seem to influence the perception of migration. Therefore, migration does not represent a major adaption strategy up to now.

3.3 Methodology

The research results presented in this paper are part of on-going research produced by a project consortium named “New Regional Formations – Rapid Environmental Change in Coastal Regions of Ghana and Indonesia” (NRF), bringing together a multidisciplinary team. In order to understand the interrelation of migration trajectories with (climate induced and man-made) environmental change our empirical research analyses two regional cases that experience since many years a fragile ecological situation, characterized by frequent flooding and erosion. The two regions show high population dynamics. In our methodological framework we decided not to compare the two situations as such but to confront two regional settings in order to sharpen the perspective on common and distinct features regarding the nexus of migration and environmental change. We deliberately turn away from a conceptual approach that sees migration as caused by environmental change, respective environmental change as a root cause for migration. In order to understand the full picture, we started with explorative studies in the field and first expert interviews, while reviewing existing documentation on the two cases. Following the methodological tradition of triangulation, we adopted a mix of qualitative and quantitative methods during fieldwork. In each of two regions a quantitative study was conducted. It consisted in a structured household survey (274 households were interviewed in Keta in January 2015; 333 households in Semarang in December 2014). The respondents were composed as follows: Keta: 58 % male headed, 42 % female headed households, representing 1,345 household members (47 % male, 53 % female) and Semarang: 82 % male headed, 18 % female headed households representing 1,417 household members (48 % male, 52 % female).

For the purpose of this study we defined „migrants“ as persons who leave their household for more than 3 consecutive months in order to live in another place, at least another sub-district (Ind.: k*ecamatan*) of Semarang City or another community of Keta Municipality respectively or farer away. The respondents in the survey were the household heads who were asked about all household members who once used to live in the household and then moved away for more than three consecutive months.

We also analysed recent census data (2010) that allowed us to understand the bigger picture in terms of population dynamics.

The qualitative data were gathered via semi-structured interviews with migrant households from Keta in the capital Accra and neighbouring Togo, two destinations of migration from Keta, as well as key informant interviews with traditional and state authorities in Keta. In Semarang the

qualitative interviews consisted of key informant interviews with heads of villages and sub-districts in Semarang Municipality.

The two case studies selected stand as two examples for the complex relationship between environmental change and migration in coastal areas in tropical countries. They are neither representative for the whole country of Ghana or Indonesia respectively, but rather could be interpreted as showcases of the broader picture.

3.3.1 Description of the study site no. 1: Keta (Ghana)

Keta is a place with an outstanding tradition of migration and environmental change (Akyeampong, 2001). The local population of the Anlo-Ewe, the dominant ethnic group in the area, lives in a sometimes ambiguous relationship with nature as on the one hand providing their livelihoods and on the other being a threat in forms of droughts or floods. They are as well aware of the (negative) consequences of large development projects for their environment (ibid.: 2). The Anlo-Ewe migrated from Notsie, which today belongs to Togo to the south eastern Ghanaian coast in the 17th century. This ethnic group cherishes its own migration saga (Kumassah, 2009). The Anlo-Ewe originally were no maritime people and do continue to have a fierce attachment to land (Akyeampong, 2001). Local perceptions of environmental change can be traced back to coastal erosion from the early 20th century onwards causing loss of property and land in Keta, experienced as a loss of regional pride and encouraging emigration (ibid.). Already in the 1980s two thirds of the town were destroyed by the sea (ibid.).

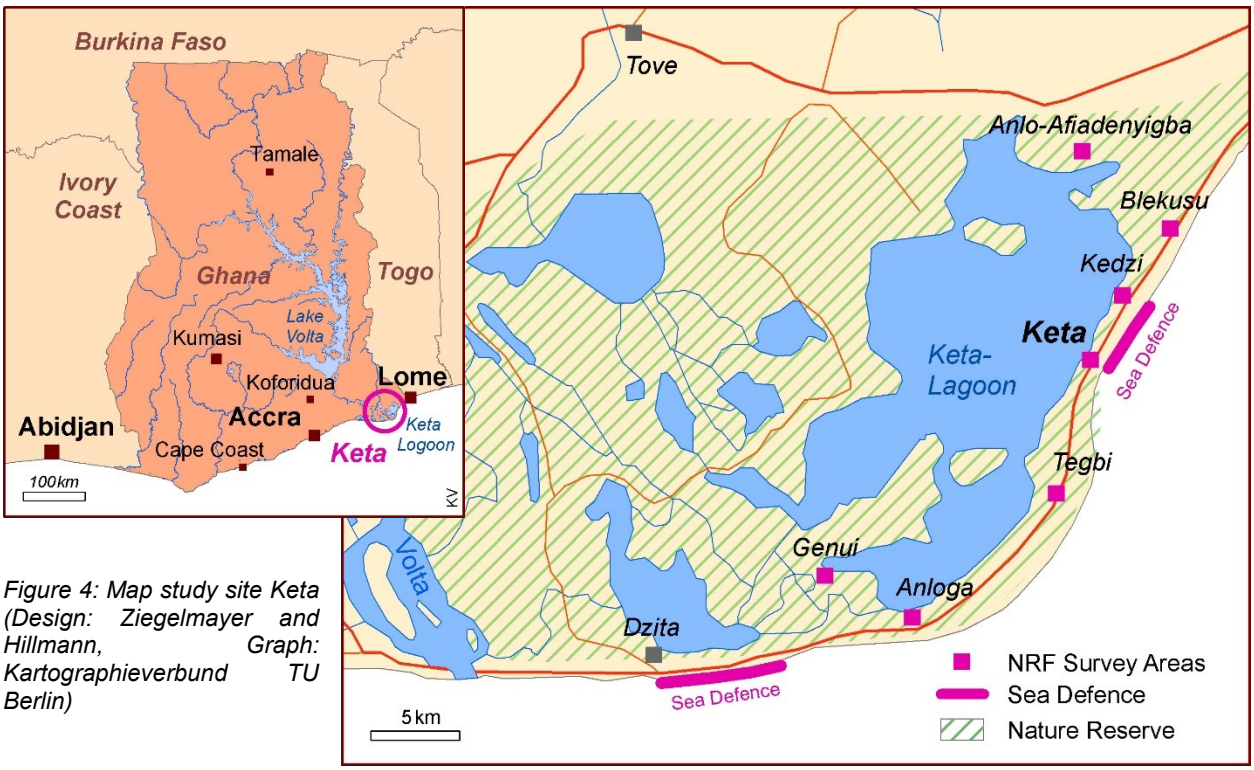

Figure 4: Map study site Keta (Design: Ziegelmayer and Hillmann, Graph: Kartographieverbund TU Berlin)

Keta Town is located on

a small sand bar between the Golf of Guinea in the South and the Keta Lagoon in the North. The town has a long history as an important market place with traders from neighbouring regions and countries and a small port. However, in the 1960s the city experienced an economic decline, as a result of a mix of political, economic and environmental reasons. One was the opening of the new harbour in Tema westwards, another the cutting of a canal trough the sandbar near the market in order to open the lagoon into the sea and decrease the flooding pressure. This intersection unexpectedly led to a large flooding in Keta town as the canal grew bigger than planned for. Additionally, in 1968 the regional capital was transferred from Keta to Ho and in 1969 the Aliens Compliance Order expulsed many foreigners doing trade at Keta market (Akyeampong, 2001). These factors, in combination with the destruction by the erosion, induced a period of economic decline of the town Keta, that lost its market functions. This development was accompanied by out-migration in the last decades (Interview 21, Chief Kumassah, 08.09.2014).

The Volta Region, where the study area Keta is located, shows a population growth of 2.5 % from 2000-2010, corresponding with the national one (Ghana Statistical Service, 2012). The age-structure of the resident population in Keta Municipality with about 150.000 inhabitants shows a very young population: 35 % under the age of 15, 53 % between 15-59 and 12 % older than 59

years (Keta Municipality, 2010). This population structure seems likely to see strong out-migration of the young economically active population in the near future.

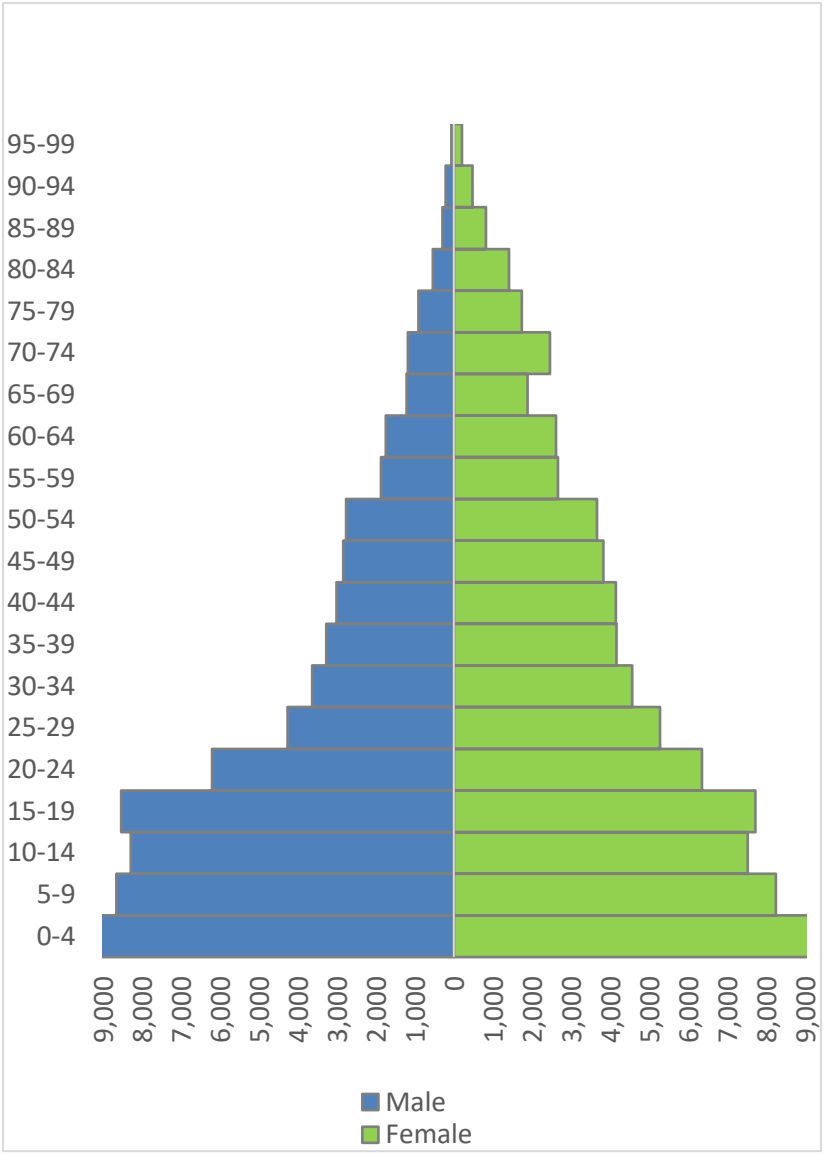

Figure 5: Population Keta, 2010 (Keta Municipality 2010: 35)

In comparison with other regions in Ghana, the Volta region with Keta Municipality features the second highest out-migration with a net-migration rate (per 1000 inhabitants, from 2000 to 2010) of -258.60, after the Upper West Region with -302.50 (Ghana Statistical Service, 2013).

3.3.2 Description of the study site no. 2: Semarang (Indonesia)

In contrast to Keta, Semarang City is a city of 1.5 million inhabitants, which regularly experiences tidal and river flooding and other environmental changes such as land subsidence and landslides. Nevertheless, it features a population growth rate of 1.4 % /year, “higher than the surrounding areas” (Mulyana et al., 2013b) indicating the city’s “importance in attracting migrants from surrounding areas,” (ibid.) The main livelihoods in Semarang city are industrial workers (25 %) and construction workers (government employees/armed forces (16 %), services (10 %) and farmers (5 %). Semarang is a city of trade, hotels and gastronomy. About a third of its population lives in poverty, with substantial local differences. Neighbourhoods such as Kemijen show a majority of the population living in poverty (Mercy Corps et al., 2010). Figure 6 shows the study site indicating the flooded areas as well as the sub-districts with negative net-migration rate near the coast and in the city centre according to the census.

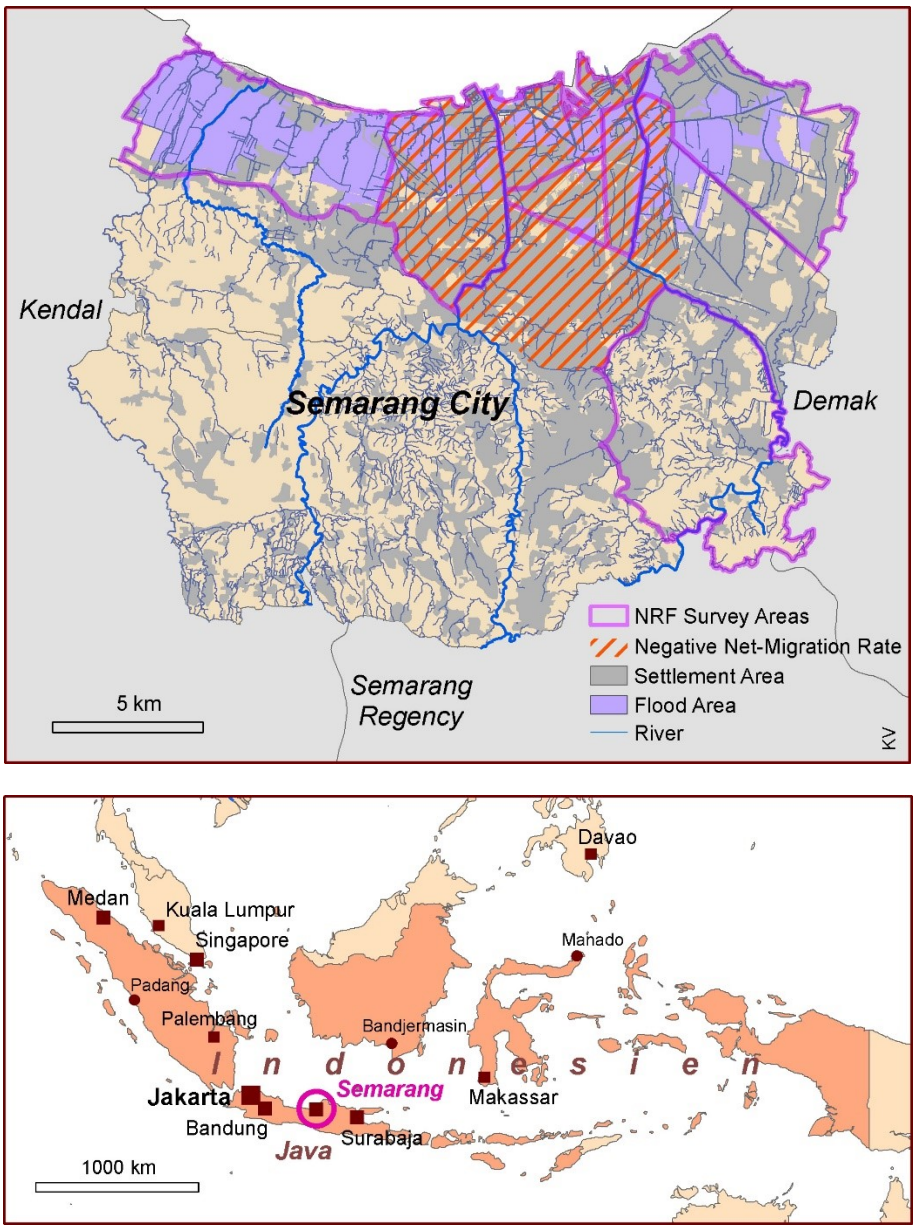

Figure 6: Map study site Semarang (Design: Ziegelmayer and Hillmann, Graph: Kartographieverbund TU Berlin; migration data according to BAPPEDA and BPS Kota Semarang 2012: xiv)

Semarang City reveals an even higher percentage of inhabitants in the productive age than the Ghanaian case: 70 % are between 15-59 years old, 24 % under 15 years and only 7 % older than 59 years (own calculations based on Badan Pusat Statistik, 2010), indicating on-going in-migration of migrant workers from surrounding rural areas into the city.

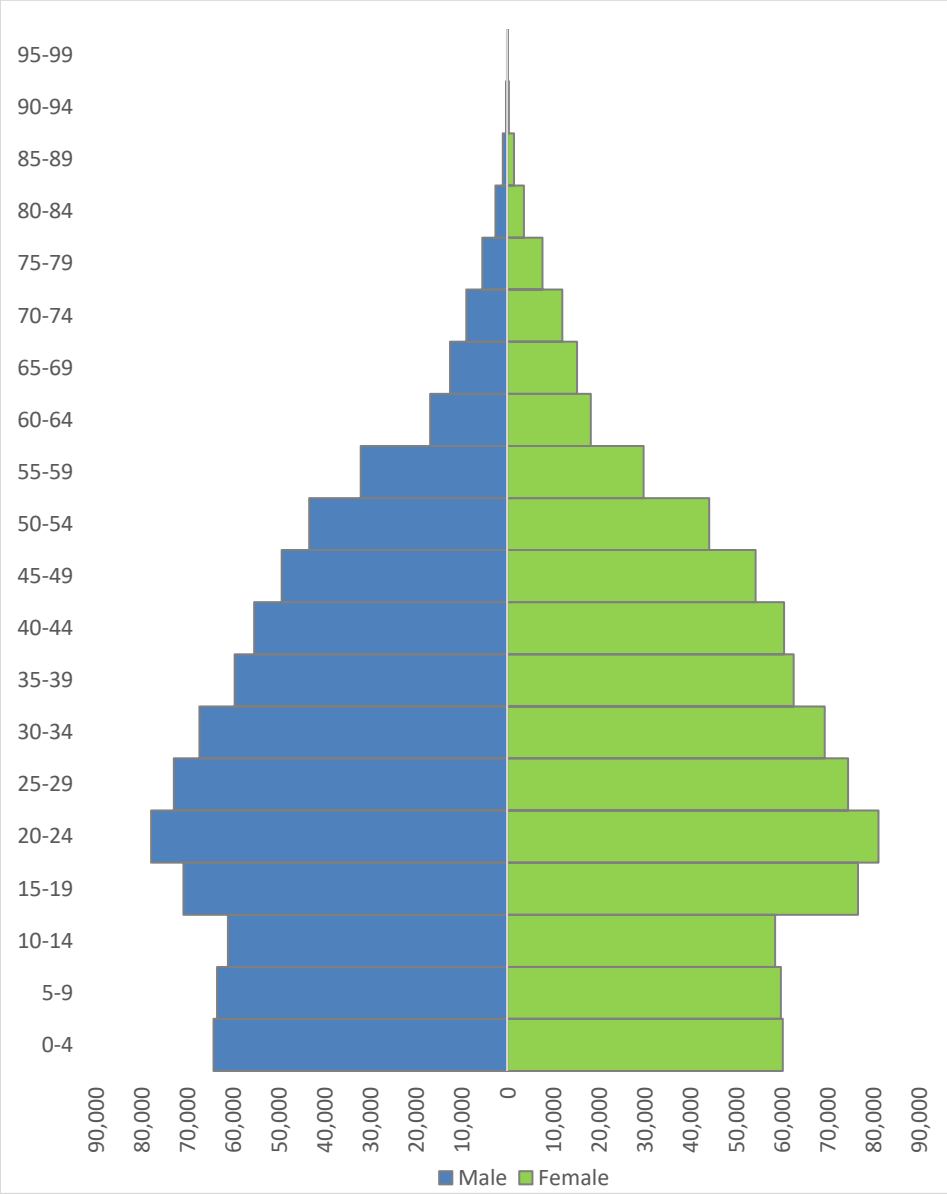

Figure 7: Population Semarang City, 2010 (BPS, 2010)

3.4 Results

This section presents the results revealed by the quantitative and qualitative research. It highlights the regional embeddedness of migration trajectories and environmental change in the two study areas.

3.4.1 Case study Keta (Ghana)

Environmental change in Keta consists of different phenomena. Coastal erosion affects the whole Ghanaian coast line with Keta being one of the most threatened areas with 2.66m of loss of coast

line a year (Appeaning Addo, 2014). Additionally sea-level rise (SLR) of approximately 3mm/year (Boatemaa et al., 2013) affects Keta. The local population is more and more aware of SLR (Interview resident resettlement area and community elder). Furthermore, changing rainfall patterns influence agriculture in the area: rainfall is “erratic, it falls at times you don’t expect it.” (ibid.) Apart from this ‘natural’ environmental changes there is a wide range of man-made environmental change as for example depletion of mangroves (Awumbila and Tsikata, 2010) and the overfishing by big European and Asian trawlers (Interview resident resettlement area and community elder; Interview Chief Kumassah). The depletion of mangroves of course affects the on-going coastal erosion and is an indicator for the entangled effects of man-made environmental changes in the area. Additionally, the consequences of the Akosombo Dam led to changing sedimentation (Akyeampong, 2001). This affected the fishery livelihoods in the Lower Volta, including Keta Lagoon, and led to out-migration towards the Volta Lake (Awumbila and Tsikata, 2010; Interview Keta Municipality).

A major sea defence (see Figure 4) built with US financial support during 1999-2004 is supposed to protect the coast line – but is likely to shift problems of erosion further east (Angnuureng et al., 2013). The resident population is positive about this intervention and still hopes that the road that was destroyed by erosion and rebuilt as part of the project – will reopen the way for traffic to neighbouring Togo and provide access to more markets (Kumassah, 2009). Up to now however, the Keta market for example did not regain its former economic role. The chief in neighbouring Blekusu, east of Keta, which is not protected by the sea defence, claims on the contrary, that high tide affecting his community has become stronger since the defence was built (Interview 31, chief in Blekusu) and the community lost more houses in summer 2015 due to erosion and flooding. In March 2016 construction works for a sea defence were supposed to start in the area of Blekusu (Ketu South District).

Analysing contemporary migrant trajectories in this changing environment, our survey reveals that 65 % of all interviewed households got experienced out-migration of some of their members. 53 % of those out-migrants were male and 47 % female. A small share of those migrants was accompanied even by children leading to more than 800 out-migrants including children, in the interviewed households.

Most of the migrants were son or daughter of the household head (38 %), followed by “other relative” (24 %) and brother/sister of the household head (21 %). Most of these migrants had completed middle school (34 %), followed by graduates from senior high school (26 %) and those who only had primary school education (20 %). When leaving most migrants were between 10-

19 (45 %) or 20-29 years (37 %) old. Chief Kumassah refers to the age structure of out-migrants with mostly youths leaving and puts migration in relation to life-cycles: “when we retire we come home, but the active population is outside and is not helping us to develop our area, because when you’re young, you can develop your area.”

We claimed that migrant trajectories put forward a view on migration as a non-linear process. Indeed, about a sixth of the out-migrants were return migrants who left Keta and then came back for a period of more than three consecutive months. Also qualitative research evidenced the important role of return migration. Some international migrants recently came back to invest in tourism, into health facilities or a “pure water” production factory in Keta Municipality (Interview resident resettlement area Kedzi, community elder; Interview community elder Anloga) thereby contributing to local development. Development studies also point to the growing importance of chieftaincy for regional development (Kleist, 2011), referring to the institutional aspects of migration trajectories.

The fact that 12 % of all out-migrants in the interviewed households indicated several destinations also stresses the process like character of these migrant trajectories. The majority first moved to big cities, mainly Accra. For 16 % of these multiple migrants (two destinations or more) the second destination was another continent, indicating step-wise migration (cf. Castagnone, 2011) with Accra being the starting point for the later international migration.

Looking at single and multiple migrants, the NRF survey indicates the following destinations:

Table 3: Destinations of out-migrations from Keta (NRF Survey 2015)

Destination	% of all out-migrations
Big Cities, mainly Accra	53 %
Other Ghanaian Regions	13 %
Other places in Volta Region	11 %
Neighbouring Countries (Togo, Ivory Coast)	6 %
Other African Countries (mainly Nigeria)	5 %
Keta Municipality	5 %
Neighbouring Municipalities	5 %
Other Continents	2 %
Total	100%

In spatial terms, these figures clearly show the regional embeddedness of migrant trajectories from Keta with a major orientation towards the capital Accra and 86% of all out-migrations being internal within Ghana. The above mentioned long migration history of Keta is also confirmed by the survey with 27% of the migrants who migrated more than 10 years ago, 18 % migrating 6-10 years ago and a recent peak of out-migration during 2008-2013 (31 %) and only 3 % migrating less than one year ago.

In contrast to conventional wisdom of mainstream migration literature (cf. The World Bank 2014), the remittances of those out-migrants indicated above did not seem to play a major role within the migration process: 50 % did not remit, 22 % sent money, 19 % sent money and goods, 5 % sent goods, mainly food.

Besides this high significance of out-migration towards places outside Keta Municipality, the survey indicates high internal mobility within the municipality. One reason for this internal mobility is coastal erosion. 18 households out of a total of 91 households which moved within Keta Municipality mentioned the destruction of their house by the sea as the reason to move. This hints at short distance migration of whole households as one adaptation strategy to coastal environmental changes like erosion. Out-migration of single individuals however, rarely seems to be directly related to environmental change. A total of four out-migrants, a share of 1 % of all out-migrants, left their former house due to flood or destruction of the house by the sea according to the interviewed households.

Mobility within Keta Municipality is directly linked to environmental change when taking into account the governmental resettlement program, of which 5 % of the interviewed households

have been part. Residents that lost their houses due to coastal erosion get new bungalows on the northern side of town. That land there has been reclaimed from the lagoon, the reclamation representing itself another man-made environmental change.

The dominant reasons mentioned, for continuous out-migration from Keta were missing work opportunities and an incomplete educational infrastructure. Against the background of Keta's past as a prosperous town, today's lack of industries in the region is reported to be one main driver for out-migration. One of the reverends stated that youths often consult him before leaving and ask him to pray for them so that they would find a job in Accra. According to him, many youths would prefer to stay in Keta if there were jobs for them (Interview reverend).

In addition to this lack of job opportunities Chief Kumassah draws a closer look on education as a motivation for migration. Although there are educational facilities up to the secondary level in Keta and some tertiary institutions, this "education makes us un-useful in our own environment" (Interview Chief Kumassah). Students are not trained to be successful in fishing or agriculture, the dominant economic activities in the area, and those who want to pursue their education at university level have to leave for the bigger cities. There is neither a university in Keta nor a training institute for fishing or agriculture that could provide adapted education for the area (Interview Chief Kumassah).

The fact that international migration outside Africa plays a minor role in the survey supports the argument that there is a weak link between ongoing environmental change at the coast and international migration. Migration in a context of environmental change rather seems to be internal. As one respondent clearly stated, „those who have left for Europe and the US went there to work. They did so as a result of work and not because of the destruction of the sea." (Interview resident Kedzi resettlement area, community elder)

As put forward under 2.1, migration myths and narratives are pivotal in order to understand migration trajectories in Keta. The Anlo-Ewe belong to the Ewe group that got a long tradition of fishermen migration along the West African coast (Akyeampong, 2001; Odotei, 2002a; Odotei, 2002b). Until today, fishing is one of the main economic activities in the area and respondents in the interviews often refer to the migration tradition of fishermen from Keta:

> *Our people here are fishermen, a lot of them do fishing. And they migrate a lot. They migrate towards the west coast of West Africa. Some even move as far as to Canary Islands, Senegal, Gambia and all that, they fish, they stay over a year then they come back. Some finally settle in Abidjan and all other places. (Interview Keta Municipality)*

This long tradition of (fishermen) migration (cf. Odotei, 2002a, 2002b) in the area explains partly today's rather positive perception of migration as indicated in the survey. Migration is seen as

bringing (economic) benefits to the individual household (64%) as well as to the community (76 %), but people are also aware of conflicts within the community due to migration (55 %). Referring to the gender regimes inherent in migration trajectories, the survey indicates a balanced picture: 44 % agree that migration is dangerous for women while 48 % disagree.

3.4.2 Case study Semarang (Indonesia)

Environmental change in Semarang combines anthropogenic and 'natural' factors: tidal and river flooding (Anita and Latief, 2013; Marfai et al., 2008), mangroves destruction since the 1990s, urban growth leading to suburbanisation processes (Handayani and Kumalasari, 2015; Handayani and Rudiarto, 2014; Wilonoyudho, 2010) and extensive groundwater extraction worsening the land subsidence situation (Marfai et al., 2008; Marfai and King, 2007). In addition to those anthropogenic influences, the topography of Semarang city with a very low coastline and a steep mountain area (Helmi et al., 2014) makes it prone to flash floods. Further, management of tidal flood has been one of the main goals of Central Java Provincial Government. In cooperation with the Dutch government, the Banger Pilot Polder is constructed (Mercy Corps et al., 2010). The already difficult situation of a fragile water-regime gets worse through increasing conversion of forestland to settlements in the hilly areas so that water can no longer drain away. 36 % of the interviewed households had

Picture 1: Those who can afford it, lift up their house to protect it from flooding, Tambak Lorok, Kelurahan Tanjung Mas (Ziegelmayer, 09.08.2015)

already experienced river flooding (= *banjir*), 17 % had experienced tidal flood (= *rob*). 8 % of the interviewed households have experienced land subsidence.

Picture 1 shows a house where the floor has been raised by its owners in order to prevent (tidal) flooding in the house. Many owners lift up either the whole house or the floor depending on their financial means. 46% of the interviewed household had already lifted up the floor of their house at least once, in average about five years ago and for the majority about one to two meters. Those who cannot afford these protection measures either abandon the house as it is shown on right side of the picture, or they are obliged to live with repeated flooding inside their house.

Figures for migration in Semarang Municipality indicate a negative net migration rate for half of the 16 sub-districts (Bappeda Kota Semarang and Badan Pusat Statistik (BPS) Kota Semarang, 2012a). The net migration rate for the whole municipality however is positive: 38.13 (recent migration) and 167.86 (lifetime migration) for 2010. Despite its environmental challenges, Semarang Municipality has the highest positive net-migration rate in Central Java (own calculation based on, a province with high out-migration. These official migration data however, have to be handled with care as they do not show the high numbers of undocumented migrations. The projected population for 2030 is 2.1 million (Handayani and Rudiarto, 2014). The three neighbouring regencies show negative net migration rates indicating rural-urban migration movements towards Semarang City.

Our survey indicates a rather sedentary population with 54 % of the interviewed households having always lived in the same place (when interviewed) and for those who moved to the current place of living, 28% moved internally within Semarang City. We counted 265 out-migrants in 39 % of the interviewed households and 129 in-migrants in 28 % of the households.

The out- and in-migrants belong overwhelmingly to the economically active population. The majority of out-migrants was likely to be the son or the daughter of the interviewed household head (65 %). The in-migrants were either son/daughter in law (27 %), other relative (23 %) or spouse (14 %) which makes us think of marriage constituting one major reason for in-migration. The majority of the migrants was married and the out-migrants' main occupation was mainly employee (22 %), unpaid family worker (16 %), self-employment (12 %) and factory worker (9%). The in-migrants were employees (20 %), unpaid family workers (16 %) or factory workers (14 %). Most of the out-migrations are quite recent: 70 % moved within the last 10 years. In-migration is also quite recent with 72 % within the last 10 years. An important aspect of migration movements are remittances to the families back home. The survey points at 42 % of the migrants remitting, mostly money. The survey in Semarang indicates family as a major reason for out-migration (55

%), followed by work (30 %) and education (7 %), the same order of importance holds true for in-migration to Semarang.

One important aspect of migration trajectories are narratives around migration. In Semarang the perceptions of migration by the respondents are rather ambiguous: 49 % perceived migration rather negative and stated that “you should never leave your place of origin”, about half of our sample see no further benefits for the household in the migration of household members. This indicates that the migration of one household member is not a major strategy to improve the situation of the whole household. However, 60% agreed that migration brings benefit to the community.

A major part of mobility in Semarang is taking place within the municipality. 24 % of in-migrants moved from another sub-district within Semarang to their current place of living. The out-migrations are indicated as follows:

Table 4: Destinations of out-migrations from Semarang (NRF Survey 2014)

Destination	**% of all out-migrations**
Other sub-districts of Semarang City	32 %
Other Indonesian islands	16 %
Other places in Central Java	14 %
Neighbouring Municipalities	13 %
Big cities, esp. Jakarta	12 %
Other Provinces in Java	8 %
Other countries	3%
Don’t’ know	1%
Total	100%

These results might be explained by the perception of internal migration within Indonesia being better than international migration – as stated by 67 % of the respondents. Handayani and Kumalasari (2015) refer in this context to a Javanese value of staying with the family (*mangan ora mangan ngumpul*). In this regional setting attachment to place turns out to be an important denominator for the outline of migrant trajectories.

According to our survey Semarang hosts only a few multiple migrants. The in-migrants mostly come from other places in Central Java (36 %), neighbouring regencies (17 %), other islands (11 %) or other provinces in Java (8 %). Studies on the neighbouring regencies show cases of fishermen who migrated to Semarang’s industrial centre looking for work after a decline in fish

catch due to environmental hazards like “flood, coastal inundation and subsidence” (Handayani and Kumalasari, 2015: 123).

As for the organisation of the individual migration projects only 29 % of the in-migrants received assistance for their migration, most of them by household members of the household they are now living in or from other migrated relatives. Only 28% of the out-migrants had received assistance by household members or other relatives.

3.5 Discussion

As shown by the two case studies the interrelation of environmental change and migration cannot be regarded as mono-causal. In order to understand current migration trajectories as well as immobility in contexts of environmental change, the integration of past migration experiences as well as the perception and expectation of former environmental changes among the local population into the analysis is crucial.

Referring to one of the study regions, the south-eastern coast of Ghana around the Keta Lagoon, Arthur and Arthur (2011) identify flooding during the rainy season as a major source for temporal migration along the Ghanaian coast. In a World Bank Report (2010) Yaro states that some fishermen from the coastal zone have migrated to Atakpamé in neighbouring Togo or to Accra because fishing or farming in their home communities did not secure their livelihood any longer. This corresponds to our findings concerning regional migration along the West African coast.

In the case of this coastline, the observable man-made environmental change due to big development projects or infrastructural projects with the aim to adapt to climate change, often goes along with governmentally controlled population resettlement policies. In the Ghanaian case, large-scale infrastructure projects such as the Akosomobo and Bui dam led to resettlement programs that did not correspond to the peoples` needs. Over half of the resettled population left the new resettlement townships within four years after the project implementation (Hart 1980, cited in Miescher and Tsikata, 2009/2010). The construction of the dam led to environmental and social decline for the communities at the Lower Volta. Awumbila and Tsikata (2010) show in a detailed case study on gender, land tenure and mangrove exploitation in South Tongu District (Lower Volta), on the Western border of the study area Keta, how the dam construction severely affected the livelihoods in the communities in the Lower Volta. It remains to be shown how the construction of the Sea Defence which is protecting part of the coastal populations for now, will affect livelihoods in the surrounding areas due to changing water streams and sedimentation and thereby stronger erosion further east.

Regarding the Indonesian case, the results of our NRF survey suggest higher out- than in-migration for Semarang, contradicting official migration data. This fact hints at a high number of undocumented migrations, but could be attributed also to the rather neat definition of migration as movement from at least one sub-district (*Kecamatan*) to another. In comparison with the Ghanaian case and putting into account the various environmental changes, Semarang – even if being subject to frequent and increasing floodings - does not experience strong out-migration related to environmental change. In contrast, the city presents itself as a highly dynamic urban centre that still attracts migrants (workers) and where the local population tries to adapt to the degradation. Its inhabitants raise the floor of their houses, build small dams etc. (Marfai et al., 2008; Handayani and Kumalasari, 2015). "[…] for many houses in the coastal area in Semarang, the houses have a particular room under the roof called as tataban to keep their valuable goods during the flood" (Kumalasari, 2014, cited in Handayani and Kumalasari, 2015). As point out this strong in-migration into an area with various environmental challenges might lead to difficulties, especially for newly arriving migrants. Recent migrants might be less resilient to climatic changes due to their limited integration in the community and therefore less social capital to adapt to challenges due to climate change. As Marfai et al. (2008) show in a study on two coastal villages of Semarang city, one reason for less out-migration than expected from coastal areas threatened by flooding might be a lack of financial resources which does not allow to move away. This situation hints to the existence of a large proportion of the population, that recent literature has classified as "trapped populations" (Black and Collyer, 2014).

In both case studies the role of remittances, representing the link between the local communities and the migrants, was not such significant as we expected it to be within a highly dynamic migratory setting. Also, the perception of what migration might bring as benefits to the household and to the community along the resident population was challenged in our survey: while two thirds of the Ghanaian respondents saw out-migration as a rather positive event, only a quarter of the Indonesian respondents welcomed migration as a possible strategy to improve the household's situation. However, more than half of the Indonesian respondents agreed that migration brings benefit to their community, a result that points to a regionally highly diversified perception of migration as a coping strategy concerning environmental stress.

As with regard to the assumptions of the theoretical literature on migrant trajectories (cf.; Vaittinen, 2014; van der Velde and van Naerssen, 2007; Schapendonk, 2012), in both cases our interviews revealed that the 'mental distance', here understood as the emotional involvement attributed to eventual mobility and migration, played a considerable role in shaping migratory flows. Migration

and mobility, especially international migration, proved to be an acknowledged part of survival options in the Ghanaian case. In the Indonesian case people showed to be much more attached to their place of residence by feelings of belonging as well as belief-systems. Here the concept of mental thresholds as put forward by van der Velde and van Naerssen (2007) seemed to be at work. Additionally, immobility and “trapped populations” stood out as a constitutional part of the nexus between environmental change and migration. Missing resources among the resident population were the major explanation for the reluctance of households to consider out-migration of their current (frequently flooded) neighbourhood. Here, in contrast to the Ghanaian situation resettlement was neither an option for the resident population, nor a solution that was pushed forward by governmental programs.

3.6 Conclusions

The two case studies presented in this paper show that Ghana’s and Indonesia’s coastal areas are both exposed to environmental changes but that populations concerned react quite differently. The pronounced regional analysis, which sets the focus on the role of migration trajectories within the changing migration regimes can be helpful to understand better this complex relationship. By using the two cases as examples of different contexts of coastal environmental changes, a tentative typology of how populations react in terms of migration and mobility can be deducted.

Keta in Southern Ghana might work as an example of a small town that is embedded into a longstanding migration history with its own migration saga, and that has been linked up to today to international, regional and internal migration networks. The town is still characterized by fishing and agriculture as main livelihoods and could not compensate the former loss of regional functions. In this case migrant trajectories are embedded into a culture that perceives migration as part of life and welcomes the mobility of women and men. Due to the long history of migration in the area today’s migrants can often rely on contacts at the destinations facilitating the migration project. Strong international ties and skilled migration are frequent. Additionally, former emigrants cooperate with the local institutions such as municipality or the traditional chiefs and do set up infrastructure. In the context of environmental change, short-distance migration within the municipality seems to be one adaptation strategy.

Semarang City on the other hand represents a booming urban centre with growing industries and an expanding service sector. The city attracts (labour) migrants from the surrounding areas. The place shows mobility rather sedentary population and some out-migration mostly within Indonesia. International migration is an exceptional feature. The populations that live in the most affected

areas by flooding are extremely vulnerable and dependent on immediate incomes in the informal sector or neighbouring industries. The places in which they live have been subject to seasonal flooding for a very long time. In this setting out-migration, especially international migration, does not seem to be an (adaptation) option but is rather perceived as a threat by the local population.

In both regional cases, a straightforward causality between environmental changes at the coast and out-migration could not be identified. Migrants however were able to perform as actors within changing regional realities and, depending on their perceptions and interpretations, migration became an option, not only in reaction to environmental change. The Keta-setting calls of a typology that pronounces migration trajectories as part of long-standing interregional and international migration, the Semarang-setting might be classified as a rather typical modernization-induced migration scheme, linked to rapidly growing urbanisation, with “trapped populations” on the one side and in- and out-migration of (labour) migrants on the other side. The authors see an important lacuna in research in the further exploration of the entanglement of man-made environmental change, urbanization pattern and migrant trajectories.

4. Migrant trajectories within the context of demographic, socio-economic and environmental change. Evidence from coastal Ghana[27]

4.1 Introduction

West Africa is a region with a highly mobile population since precolonial times, and international as well as internal migration remains significant today. Our chapter presents a case study of Keta, a coastal region of southeastern Ghana that has experienced migration and mobility for generations and at the same time has been affected by environmental changes like coastal erosion and flooding for decades. Rather than focusing solely on environmental change as a driver for migration, an assumption that is too simplistic and contested (Piguet, 2013; Gemenne, 2010; Black, 2001), we use a broader perspective to explain the underlying causes of migration patterns. Applying a household history approach combined with the concept of migrant trajectories, this chapter aims to understand how migrant trajectories are formed in a rapidly changing socio-economic context, including environmental change. Employing such a perspective provides a more comprehensive explanation of mobility patterns by giving rise to a broader range of relevant questions to be answered. How does social change, for example economic and political decline, translate into migrant trajectories? What is the role of 'traditional' forms of migration and how do regional mobility regimes and environmental change come into play? Based on the analysis of family genealogies with a focus on migration histories, this paper aims to identify major types of migrant trajectories at the nexus of environmental change and migration.

[27] This chapter is the third paper of this cumulative dissertation: Ziegelmayer U and Spaan E (2018) Migrant trajectories within the context of demographic, socio-economic, and environmental change: Evidence from coastal Ghana. In: Hillmann F, van Naerssen T and Spaan E (eds) *Trajectories and Imaginaries in Migration: The Migrant Actor in Transnational Space*. Abingdon, Oxon, New York: Routledge, pp. 34–55. [published in edited volume]. . It was first printed in 2018 b Routledge and is reproduced with permission of the licensor through PLSclear.

4.2 Theoretical framework: Migrant trajectories and household history[28]

This chapter introduces a concept gaining importance in migration research recently: migrant trajectories. Migrant trajectories work "as the collective and 'visible' outcome of many individually migrating persons." (Spaan and Hillmann, 2013: 65) and thereby stress migration as a non-linear process. The concept implies "a shift in focus from the individual to a structural view on migration processes by concentrating on the outcome of collective biographical paths or as a repeated spatial arrangement of migrants." (ibid.). In order to understand the migration patterns and the role of environmental change in relation to other contextual factors, household histories from the study region are used as a point of departure.

Analysing environmental change as one factor in a context of a variety of other factors influencing migration, we refer to current debates in academia on the nexus of environmental change and migration. (Felgentreff and Pott, 2016) for example wonder whether migration cannot just be understood by "well-known conditions and factors like uneven economic development, educational aspirations, poverty, social networks or vulnerability of precarious livelihood systems?" (2016: 73) without assuming a direct link of environmental change and migration. This approach follows an understanding of the relation of migration and environmental change as non-linear and is stressed by authors like Black et al. who underline the role of migration as social phenomenon of "social and demographic interaction and change" (2011: 2), or Tacoli (2011), who puts forward the important role of socio-economic contexts influencing migrant trajectories in a changing environment. Environmental change is also not a new phenomenon, but has been part and parcel of Ghanaian livelihoods for generations; thus, the importance of environmental change as a driver of mobility should not be overstated, but rather, should be seen as one underlying factor influencing household livelihood strategies, next to other factors.

Referring to Kulu & Milewski (2007) and Kou et al.'s (2015) work on the life course approach to (high-skilled) migration, this chapter aims to understand migrant trajectories "not only in response to labour market triggers, but also in relation to education, employment and household trajectories" (Kou et al., 2015: 1645). We aim to use the concept of migrant trajectories in two ways: as life trajectories and spatial trajectories. Van der Velde also conceptualises migrant

[28] This paragraph on the theoretical concept of migrant trajectories is inspired by an earlier publication (Hillmann, Ziegelmayer, 2016) and broadened with the household history perspective.

trajectories “as spatial routes connecting place of origin and places of desired destination [which] constrain or facilitate the movement of the actor in space.” (2008: 117)

Our analysis furthermore aims at widening the scope of uni-causal links between environmental change and migration by integrating the household history of affected households. Kou et al. stress the importance of “context, as events in the life course do not take place in isolation but in a specific place and time.” (Kou et al., 2015: 1645) In line with these authors, we conceptualize “migration as an inherently dynamic phenomenon, as an integrated part of the life course of individuals” and households “within the context in which they live.” (ibid.) Referring to our analytical framework Figure 8 we argue that former migrant trajectories and the thereby evolving contacts for later contemporary migrations represent an important ‘glue’ that connects the different contexts from the household to the international level via the migration trajectories.

This lens of the household history focusing on migrations of all household members is combined with the concept of migrant trajectories in order to analyse the embeddedness of those trajectories in various contexts (individual – household – community – regional – national – international). Migratory action is understood as a way of social and spatial organization in dynamic, changing contexts, for example settings under environmental stress.

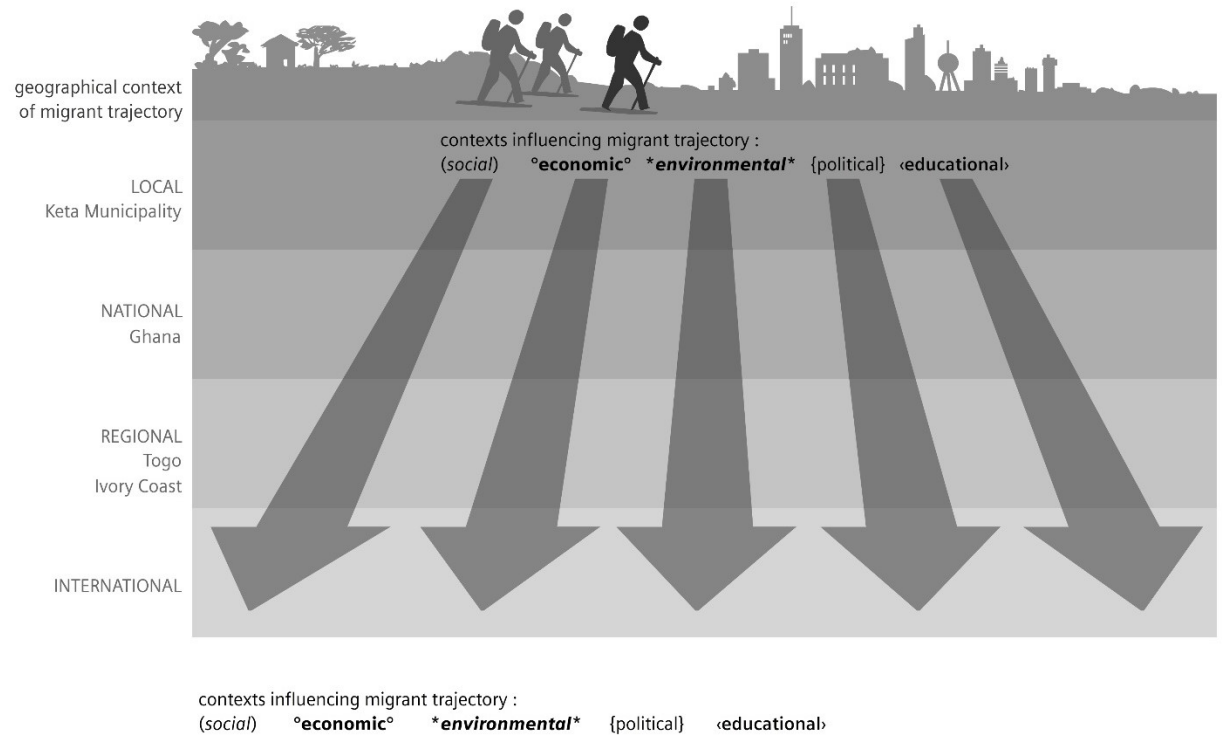

Figure 8: Analytical framework of migrant trajectories embedded in household histories; Source: Concept by Ziegelmayer and Spaan, Design by Piller.

Figure 8 shows our analytical framework, inspired by Kou et al.'s (2015) work, extended by the concept of migrant trajectories and adapted to the context of the case study in Ghana. It presents the household context with its individual members and their migration histories, together constituting the migration history of the household as a whole. The household is embedded in different contexts at various levels: the immediate context of the community, Keta Municipality[29] in our case, the national context of Ghana, the regional context including neighbouring Togo, Ivory Coast and Benin, and the international context including other continents or destinations further away on the African continent. Each of these contexts is characterized by resources and constraints. Furthermore, each context consists of different spheres – economic, social, cultural, political and environmental– and it is by the interplay and interrelation of those different spheres in each context and between them that migrant trajectories are created.

[29] Keta Municipality is the administrative entity including Keta Town as the political centre and 29 other communities with a total population of about 150,000. In this paper we use "Keta Town" when we refer specifically to the political center and simply "Keta" when we refer to the whole municipality including neighbouring Blekusu, a community in Ketu South District just East of Keta Municipality that was part of the study area.

Starting with the household including its individual members, as the primary unit of analysis allows us to understand individual migrant trajectories and their relations (being influenced and influencing) to various contexts. Furthermore, the juxtaposition of several migrant trajectories focusing on similarities in biographic, geographic, economic terms, starting from the individual and following the migrant trajectories through different contexts, allows to identify major interconnections at different levels. This model shows how the migrant trajectory is embedded in different contexts and at the same time connects the individual migrant trajectory with other individual trajectories and more collective aspects of political, social or economic contexts. Besides the above-mentioned contexts influencing migrant trajectories, some authors also refer to spaces of belonging. Migrant trajectories are formed due to geographical and mental distance as well as perception as constituting thresholds for migration in a globalized world. Apart from the 'hard' – for instance economic – factors, 'soft' and culturally bounded factors have to be taken into account as contributing to the dynamics of migration (van der Velde, Martin and van Naerssen, 2015; van Naerssen and van der Velde, Martin, 2007).

Literature on life course as well as on migrant trajectories stresses the interdependence of one life course/migrant trajectory with others: "an event in one trajectory can bring about status changes in other trajectories" (Dykstra and Van Wissen, 1999, cited in Kulu and Milewski, 2007: 569), or as Schapendonk (2012: 32) puts it "Migrants' trajectories are not closed-off corridors but open and process-like phenomena. They are influenced by, among others, the trajectories of other people, objects, capital, rules and information." This high importance of interdependence for both life course and migration trajectories underlines the assumption that both concepts represent multicausal and multilinear phenomena.

Analysing migrant trajectories using the household history lens reveals different time dimensions as vital elements for this approach. Referring to Elder (1975), Kou et al. (2015) differentiate three dimensions in the chronological order of events in an individual's life course with respect to migrant trajectories: 'individual time', 'social time' (as constituted by social norms, roles, values and institutions) and finally 'historical time', which integrates historical changes on a more global level. In the following, empirical data from southeastern Ghana are analysed according to the analytical framework, from the household to the international level, with the aim of identifying major migrant trajectories in the study area.

4.3 Methodology

This paper is based on a mixed method approach. The New Regional Formations (NRF) household survey in Keta provides quantitative data of 273 households on demographic characteristics of the population in the study region, their household assets, socio-economic status, experience with migration and environmental changes. In addition to these quantitative data, nine households were interviewed with the aim of drawing their family genealogy, focusing on the migration history of all family members. The 19 semi-structured interviews leading to genealogies were conducted with the household head and, if possible, several household members, including some of the migrants. These multiple interviews allowed us to include as many different perspectives as possible on the household's migration history. Methodologically, this approach included multi-sited research starting in Keta and following some of the migrants to the capital Accra as well as the regional capital Ho for interviews. [30] Drawn on paper during the interviews, the genealogies were copied into Excel files later on and compared in order to identify similarities and differences between the various migrant trajectories.

4.4 Case study Keta: household histories and migrant trajectories

The analysis of genealogies shows five overarching factors influencing migrant trajectories in the study area: the *demographic and migration history of one's family* with already migrated relatives as important contact persons for new migrant trajectories; the *economic decline* of Keta, as well as a decline of fish stocks leading to a lack of jobs in the area; the *lack of tertiary education* often resulting in migration to bigger cities mainly Accra; *socio-cultural aspects* like attachment to Keta as 'homeland' and a wide spread positive perception of migration; and finally *environmental change* in the area leading to mainly short-distance movement. These factors constitute the local context in which the household histories are situated. Following our analytical framework, the subsequent paragraphs present the different migrant trajectories as these are embedded in various contexts and influenced by the above mentioned factors.

4.4.1 Local and household context

Ghana has a long migration history dating back to colonial times, when people first migrated due to forced labour from the northern part of the British colony to the south. Later this north-south migration continued, for example in search for work on the cocoa plantations. The study area,

[30] The data was collected during two field trips in 2014 (2 months) and 2015-2016 (4 months).

Keta in southeastern Ghana, has been linked to international circuits since colonial times and is situated on a small strip of land between the sea in the south and the Keta Lagoon in the north. The Bremen mission was present in the area when it belonged to the German colony Togo, the Danes built 'Fort Prinzenstein' in 1784, one of the many slave forts in West Africa, and after the abolition of the slave trade Keta continued to be an important trading place in the region. [31]

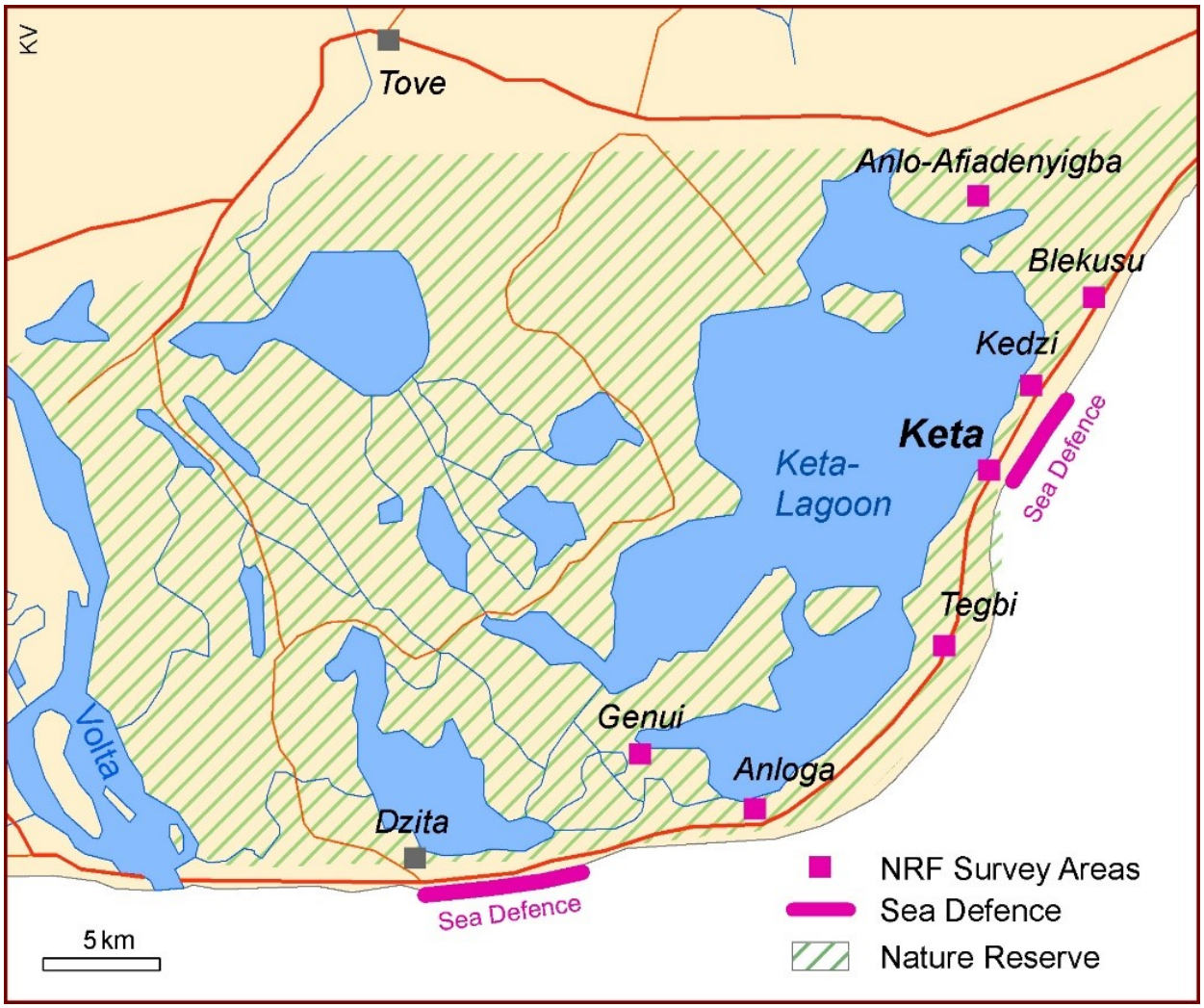

Figure 9: Map of Ghana
Source: Karthographieverbund, Technischen Universität Berlin, Institut für Stadt und Regionalplanung, 2016

Today the Volta region, where Keta Municipality is located, features the second highest outmigration in Ghana, after the Upper West Region (Ghana Statistical Service, 2013). The Anlo-Ewe, the dominant ethnic group in the area, are said to have migrated to Keta from Notsie in today's Togo in the seventeenth century and celebrate this migration-saga (Kumassah, 2009) during an annual festival, one example of embeddedness of migration in regional knowledge

[31] In the publication it is wrongly stated that the map is from 2017.

systems and narratives. As the following quote also shows, the memory of a vibrant past is still present among Keta's population and its migrants:

> *Well Keta used to be a very busy commercial town where activities, a lot of activities go on there. Even people from the Northern and Southern part of the country move to Keta to buy fish. Keta is noted for fish farming or the fishing industry in Volta region […]. Ho development began not quite, over two decades ago. You know with the effects of the sea erosion, road networks are no longer linked, are not favourable for commuters or traders. […] now Ho has assumed the status of regional capital so it's growing or developing faster than Keta. Government attention or the focus of government is no more on Keta. It's on Ho. (Interview with migrants Ho)*

This quote from a couple from Keta who moved to Ho in 1991 refers to the historical time mentioned earlier and indicates the decline of Keta in various aspects, economic, political and environmental. Keta used to be the capital of the Volta Region, well embedded into regional trade and mobility circuits. After independence in 1957, however, the town started to experience a decline, which was influenced by developments at the national and regional level as well as local environmental change: the port was closed as a new harbour opened in Tema near the capital Accra in 1962, a canal east of Keta Town was cut in 1963 in order to release the town from lagoon flooding. Instead of releasing flood pressure, however, this canal caused a severe sea flooding that cut off Keta Town and its market from the surrounding communities. In 1968 the regional capital was transferred to Ho, and finally in 1969 the Aliens Compliance Order forced foreigners, among them many Nigerian traders at Keta market, to leave Ghana, giving a blow to Keta's regional market function. Additionally, national infrastructure projects like the construction of the upstream Akosombo Dam in the Volta River during the 1960s changed sedimentation at the estuary and led to a decline in fish and clam stocks in the lagoon.

Referring to our analytical framework, these developments represent the local context of Keta Municipality and its surroundings in which the various household histories are embedded and which symbolises a point of departure for migrant trajectories. The NRF survey indicates that the population is positive about migration: 64 % of the interviewed households see migration as bringing (economic) benefits to the individual household, while 76 % consider it as beneficial to the community.[32] Migration seems to be part of every family's reality somehow - during the field research, households that did not have migrants among their immediate members nevertheless always knew of relatives who had migrated from Keta.

[32] Migration perception was measured using a Likert Scale. The percentages given refer to the following statements: "Households with migrants are better off than households without migrants."; "Migration brings benefits to our community."

The genealogies confirm the long history of migration. There is no family where migration only occurred recently among today's youths. On the contrary, there are grand-parents who already migrated to Ivory Coast over 50 years ago; or consider the case of one family, who can trace back their history to their paternal great grand-father, who worked as a German engineer in the former German colony of Togo. These examples show the colonial legacy of migration in the area and its regional embeddedness.

Looking at the household level, the NRF survey gives the following overview: 65 % of the households indicate permanent[33] out-migration of some members (53 % male, 47 % female). Including the children accompanying migrants there were more than 800 permanent outmigrants, identified by respondents as formerly being part of their households. Additionally there were 122 circular migrants and 139 return migrants.[34] Migrants were mostly sons or daughters of the household head (39 %)[35] and had completed junior (34 %) or senior high school (26 %). The majority of the migrants were aged 10 to 19 (45 %) or 20 to 29 years (37 %) when leaving.

4.4.1.1 *Short distance mobility due to environmental change*

The economic political and environmental developments alluded to earlier took place in an area that has known coastal erosion since at least the beginning of the 20th century (Akyeampong, 2001). So far, severe flooding and erosion have already destroyed a fair share of buildings in Keta, and the coastal road linking Keta with the Togolese capital Lomé has been destroyed several times. A large-scale sea defence was built in order to protect the town and prevent further erosion. This construction protects some communities but has worsened the erosion in areas without sea defence further east (interviews in Blekusu east of Keta). Currently there are plans to extend the coastal protection up to the Togolese border.

Nevertheless, environmental change in Keta has not led to massive out-migration but merely to short distance mobility within the municipality or to neighbouring communities. Reactions to environmental change differ depending on the social and financial resources at one's disposal as well as on constraints on the local level. Those families who own another family house at a flood-

[33] "permanent" referring to migrants who once lived in the household and had left the household at least for more than 3 consecutive months already at the time of the interview.
[34] „circular migrants" referring to those who migrated for a period of 1 to 3 months during the last year and „return migrants" referring to those who migrated for a period of more than 3 months during the last five years. Both categories refer to persons who were living in the household at the time of the interview.
[35] For the return migrants the percentage of son/daughter of HH (35%) head is closely followed by the HH head (31%) indicating former migrations of the HH head.

safe area move to this house, while others who do not have a second free house but have relatives living nearby move to stay with them, some on a short-term basis. Those with financial capital either already own land in a flood-safe area where they build a new house or buy new land and built their house there.[36]

As flooding and erosion have affected Keta for a long time there are several families who did not only move once within the community but are currently staying in the fourth or fifth house since the first destructions. While this continuous rebuilding itself representing a financial challenge for the household, it also indicates a high internal mobility within the municipality. Three communities benefited from a governmental resettlement program with a total of 800 bungalows planned to be built as part of the sea defence project. This resettlement program is one example of national development policies, supported by international funding, influencing the local context.

Apart from the obvious environmental threats through flooding and erosion, the coastal populations in Keta suffer from salinization and drying up of their fields and water sources due to erratic rain and droughts, as well as from sea water intrusion, which also leads to wells near the shore being silted up.

4.4.1.2 *Cultural aspects influencing migrant trajectories*

Besides short-distance mobility due to environmental change, another type of migrant trajectory present in some of the analysed genealogies is the migration of young children without their parents. There are two ways: either a child is taken out of Keta to live with a relative in Accra or another big city or a child is sent back to Keta to go to school while the parents stay in Accra or other places outside the Volta Region. The first case, children's out-migration from Keta, is inspired by the belief that a couple without children will get a child of their own if they adopt one (interview migrant Accra), one example how migrant trajectories are influenced by cultural beliefs. Child fostering is a common cultural practice in Ghana, or West Africa for that matter (Isiugo-Abanihe, 1985; Klomegah, 1998).

In other cases, the relative in Accra or other big cities is economically better off and offers to take care of one of his/her siblings' children in Keta. S/he takes the child to school in Accra, as in the case of one of Mohammed's daughters, who grew up with her maternal uncle in Accra:

[36] The collected data indicates that migration related to environmental change is rather short-distanced. There might however be a lack in information concerning those households that had already migrated (maybe also farer away) some time before this research was conducted and that could not be traced back.

> *In fact, I have no objection, I can't say… because since is her uncle moving her to come and move with his daughter to be there, to be two, going to school, I have no objection and even today, I have benefited from it because […] her schooling, it's the uncle who sponsored her […] I don't have that capacity to even, to cater for her schooling up to the university level. (Interview with migrant household)*

The opposite scenario of children who are sent back to Keta without their parents to go to school is linked to the cultural aspect of keeping in touch with the 'homeland' and its culture and language. The genealogies show parents who were quite successful economically in Accra and whose children were born in the capital. At one point however, they decided that the children should spend some years of schooling back in their 'hometown' in order not to lose their parents' Ewe culture and language. In some cases, those school years in the parents' hometown are a motivation today to be still actively involved in the area, for example through social projects.

4.4.1.3 *Migration for education after completing school in Keta*

The educational factor influencing migrant trajectories from Keta is important on the national level as well. This type of migrant trajectories is influenced by individual time, the biographical moment (when one completes school and seeks for possibilities to further one's education) and the social context in Keta as departure area as well as in the destination. Keta does not provide tertiary education except for a nursing training college – a constraint at the local level. Considering the lack of educational infrastructure and the very young population (35 % under the age of 14 and 20 % between 15 and 24 years old), it is obvious that those who have the opportunity migrate in order to further their education in Accra or other big cities in the country. The NRF survey mentions *education* as the second most important reason for out-migration after *(search for) work*: 24 % of the migrants left for educational purposes.

However, educational migration from Keta however sometimes starts already at an early age, when pupils at (senior) high school go to boarding school in another community or district. This indicates how migration and mobility are part of everyday life in the area, already from a young age. Migration for education most of the time leads to employment outside Keta, and return migration afterwards is very rare:

> *you see, there is no work in this town; the majority of us when we finish school, like when you finish secondary school, you need to move up, there is no university in this town. So we need to move to university, maybe after our university, when we find some job doing in Accra, we don't come down again. (Interview with migrant Ho)*

One family genealogy with ten siblings exemplifies out-migration, especially for education, with rare return migration. All siblings furthered their education outside, and only three returned to Keta. The other migrant trajectories show at least two different destinations and one of the big

cities in Ghana - Accra, Tema or Kumasi - as current place of living (Interview with migrant, Accra), illustrating the importance of urbanisation for migrant trajectories. One chief in the area sees a change in migration drivers from the search for better fishing grounds to education. He advocates for education adapted to the area's needs, for example training colleges for fishery and agriculture, in order to sustain local livelihoods for the younger generations. Education-related migration is either internal to bigger cities with universities like Accra, Kumasi or Cape Coast (the national level) or directed to smaller cities with training colleges. Those who move to the regional capital explain this choice by the geographical proximity to Keta, the lower costs of living compared with Accra and the possibility to stay in the same linguistic Ewe-speaking area.

4.4.2 National context

The education-related migrant trajectories clearly link the local with the national context, and in some cases the international one (see the section 'International (intercontinental) context' later). A second migrant trajectory directed to the national level is migration due to differentials in employment opportunities resulting from biased development policies favouring the capital Accra and surroundings (Tema). There are only a few jobs in Keta, especially in the formal sector. The interviews indicate either a concrete job opportunity or often just the hope to find work elsewhere as a driver of out-migration:

> *Many actually, work brings them to the city here in Accra, others schooling brings them here, others job. Because when you live at the coast […], you are either a fisherman, a teacher, a nurse, a doctor… Apart from that there is not much job over there. So a lot of them who want to exploit another field they would have to migrate from that place to Accra. (Interview with a second-generation migrant, Accra)*

These migrant trajectories motivated by search for work often not only concern individuals but lead to the migration of whole families, initiated by the migration of one family member, usually the household head. Some migrate on their own initiative; others are transferred due to job reasons. The latter is the case mostly for government workers, teachers, and the military, who are transferred to different places around the country (or even abroad), an example of national policy influencing migrant trajectories from Keta.

This lack of employment opportunities in Keta is present in two narratives told by migrant households and migrants themselves: coastal erosion has affected Keta for many decades leading to the destruction of farm land and coconut groves. The economic decline was exacerbated due to the closing of the harbour, the loss of importance of the market in Keta Town and the closing of many trading activities. As a consequence of this decline of the once vibrant

town, job opportunities decreased in Keta which then led to out-migration. This narrative is also confirmed in the literature (Akyeampong, 2001). Outmigration in search for work in this case seems to be related only indirectly to environmental change. On the other hand, national infrastructure projects like the sea defence project help to protect the area from further erosion but have -as of now- not yet succeeded in reviving Keta.

The second narrative is complementary to the first one. Accra is perceived to offer a lot of opportunities. Mawousse, who migrated to Accra two years ago and who is currently selling fruit near one of the main markets, stresses that Accra offers much more business opportunities than Keta. Some of those who migrated during their economically active age and/or succeeded in establishing their life in Accra or even abroad decide to 'return home' at retirement age, or to return and invest in tourism. Remembering its vibrant past, this investment is motivated by the wish to contribute to Keta's revival and is encouraged by the sea defence protecting the town and giving hope for further development.

4.4.3 Regional West African context, e.g. fishermen migration

Another type of migrant trajectories with a probably longer history than migration for education is fishermen migration. The so called '(Ewe) fishermen migration' is widely discussed in the literature (Odotei, 2002a; Odotei, 2002b; Overa, 2005) and links the local context with the regional as well as the continental one along the West African coast. The regional mobility regime at stake here is influenced by the Economic Community of West African States (ECOWAS) Protocol on Free Movement of People, providing the legal framework for migration within the West African region. The mobility regime is furthermore characterised by the tradition of fishermen migration. This tradition formerly referred to artisanal fishermen working with wooden fishing boats who migrate (temporarily) along the West African coast and sometimes settled elsewhere permanently with their families, only coming back to Keta for visits. The NRF survey however indicates only 36 fishermen among all migrants.[37]

Joseph, secretary to the chief fisherman in one of the resettlement communities in Keta, has a daughter who migrates regularly to Nigeria with her husband, a fisherman. They usually stay in Nigeria for two to three years and then come back to Keta for about six months before returning. During this time, the men are fishing and women are working as fishmongers. This fishermen

[37] 23 permanent migrants, 8 return and 5 circular migrants who were fishermen. This relatively low number might be due to the fact that the NRF survey was conducted not only in fishermen communities but also communities that rely on agriculture.

migration reflected in the genealogies shows the importance of fishing as a livelihood in Keta as well as the long tradition of fishermen migration along the West African coast following the fishing seasons. The interviews, however, hypothesize that environmental changes in Keta leading to a decline in fish stock turned circular fisherman migration into permanent migration in some cases:

> *We have certain fishing seasons, the fishing seasons differ from coast to coast. So sometimes people go from here to those coasts to fish and other people also from there come here to fish. And those people from here went to that place because of the destruction of their houses here, I mean they choose to stay there and they are still living there but they are descendant from Keta area. (Interview with community elder)*

Additionally, the interviews and genealogies reveal that recent migrations of young fishermen are not only related to artisanal fishing but increasingly to work on big (European or Chinese) trawlers. These migrations of young men in search of work as fishermen yet on international vessels, are mostly directed to either Abidjan (Ivory Coast) or Tema, which are among the biggest harbours in West Africa. This results in the paradoxical situation of trawlers, on the one hand leading to a decline in fish catch in Keta and on the other hand, providing jobs for young fishermen who migrate to the big harbours in Abidjan and Tema.

Another type of migration related to fishing is migration northwards to the Volta Lake, as was done by Komi's parents, who took all their nine children from Keta to the northern part of Volta Lake in the 1960s when fishing got worse in Keta. This might have been related to the construction of the Akosombo Dam, which changed the water regime and sedimentation along the estuary of the Volta River, affecting the fish stocks downstream.

From our qualitative data, we assume that the search for better fishing grounds as a motivation is increasingly replaced by either jobs in the fishing industry in Tema or Abidjan or the wish to further one's education.

Box 2: A fishing family

Kofi is 55 years old and lives with his family in his house in Blekusu, near Keta Town. He is the youngest of 11 siblings. His oldest brother migrated to Abidjan over 50 years ago, together with another brother. His own migration experience dates back to 1983, when he went to Togo as a young fisherman looking for work in the neighbouring country. This migration was probably influenced first, by the difficulties with fish catch in Blekusu, second, by the already existing tradition of fishermen migration along the West African coast and third, by geographic proximity to Togo. After eight years in Togo, Kofi decided to continue his migration to Abidjan. This second migration was motivated by his contact with the two brothers already living there and by work opportunities on big fishing vessels, which was more attractive than seine net fishing in Lomé. When, about 10 years ago, the French fishing company Kofi was working for closed down, he decided to return with his wife and eight children to Blekusu, where at present he is still working as a fisherman practising seine net fishing. He also opened a small shop in order to raise the household income. His son Yao tried his chance working on a Chinese fishing vessel at Tema harbour, but had to quit because of an accident and is now also back in Blekusu. Looking at the migrant trajectories of other relatives, almost all the children of one of Kofi's sisters migrated to Benin or Abidjan for fishing and Kofi's son Yao states: "We have the owners of the net [t]here, so they will come and employ you, so that you can come [to Benin] and work."

4.4.4 International (inter-continental) context

The migrant trajectories covering the longest geographical distance are the international ones. International migrant trajectories from Keta always indicate Accra as one destination before turning international, in our cases to the UK or the US. They are related in various ways to the above-mentioned trajectories: education plays a role for all international migrations represented in the genealogies, while family contacts are vital and represent an important resource for international migrant trajectories. Martha, for example, has been to the UK and the US for her studies. The majority of her siblings are working for different UN organisations in Switzerland, and she states clearly that the first migration of her younger sister to Geneva influenced the other siblings' migrations:

> *You know wherever your sibling goes and establishes, that's where the rest of the family goes... And whatever business your sibling is in, that's where he or she will direct you. So if she was cleaner in Geneva all of us would have been cleaners in Geneva (laughing). That's how it goes... (Interview with second-generation migrant, Accra)*

Martha herself planned and influenced the migrant trajectories of her children. She and her husband wanted their three children to study abroad (in the UK) in order to take over the family

business of cosmetic production in Accra later on. They financed their children's studies in domains relevant for the business and succeeded in handing over the family business to their children, who all returned to Ghana after studying abroad. This example shows how the migrant trajectories of different family members are interrelated and influence each other. Martha's as well as Albert's trajectory (see Box 3) indicates how migrant trajectories connect different contexts: from the household level to the local level in Keta (where both attended school for some years), going international due to studies and work, and then returning to Accra, all the while keeping in contact with the local context in Keta through family contacts as well as development activities. Clearly, those migrant trajectories are non-linear.

Box 3: An international trajectory connected to the local context

Albert's life course starts in Accra, where he was born to a Ga mother from Accra and a father originally from Anloga (a town in Keta District). The migration experience of the paternal side of the family dates back five generations, to his great grand-father from Togo. Albert himself comes to Anloga for the first time for junior high school after spending his childhood in Accra, the Ivory Coast and Canada. At a young age, Albert's migrant trajectory got international as a consequence of his mother's migration as a trader. The second important person to influence his further migration, still in his childhood, was his father who recalled him to Anloga to school for some years. He wanted his son to learn Ewe and to keep in touch with the local culture. After school, Albert attended university in Accra and started travelling to the UK during the semester breaks to earn some money to finance his further studies. This migration was influenced by a paternal uncle who already resided in the UK as an architect. He hosted his nephew and organized a job for him. His father also influenced this migrant trajectory as he prohibited his son from working as a cleaner or something similar and made sure that Albert got a 'decent' job. Besides the money gained in the UK, Albert's studies in Accra were financed by his father as well as by a loan from another uncle in the US. After his bachelor degree in Accra, Albert moved to the UK for his masters, initially financed by his father and later on by himself by working alongside his study. After completing his master's degree in the UK, Albert continued to work there for some years. However, when the financial crises hit, he decided to return to Ghana. Since then, he has been living in Accra and has been involved in his hometown on a family basis as well as recently via a migrant association. He argues that it was his early school years in Anloga that motivated him to be active in the migrant association. Looking at the migrant trajectories of other family members, Albert is the only international migrant among his siblings– except for one brother who went to the US for a one-year military training. Albert explains this by his early migration experiences, due to his mother, as well as his 'adventurous/rebellious' character:" I think am the most adventurous, most of them… […] and then because my mum exposed me to a few countries earlier on when I was younger".

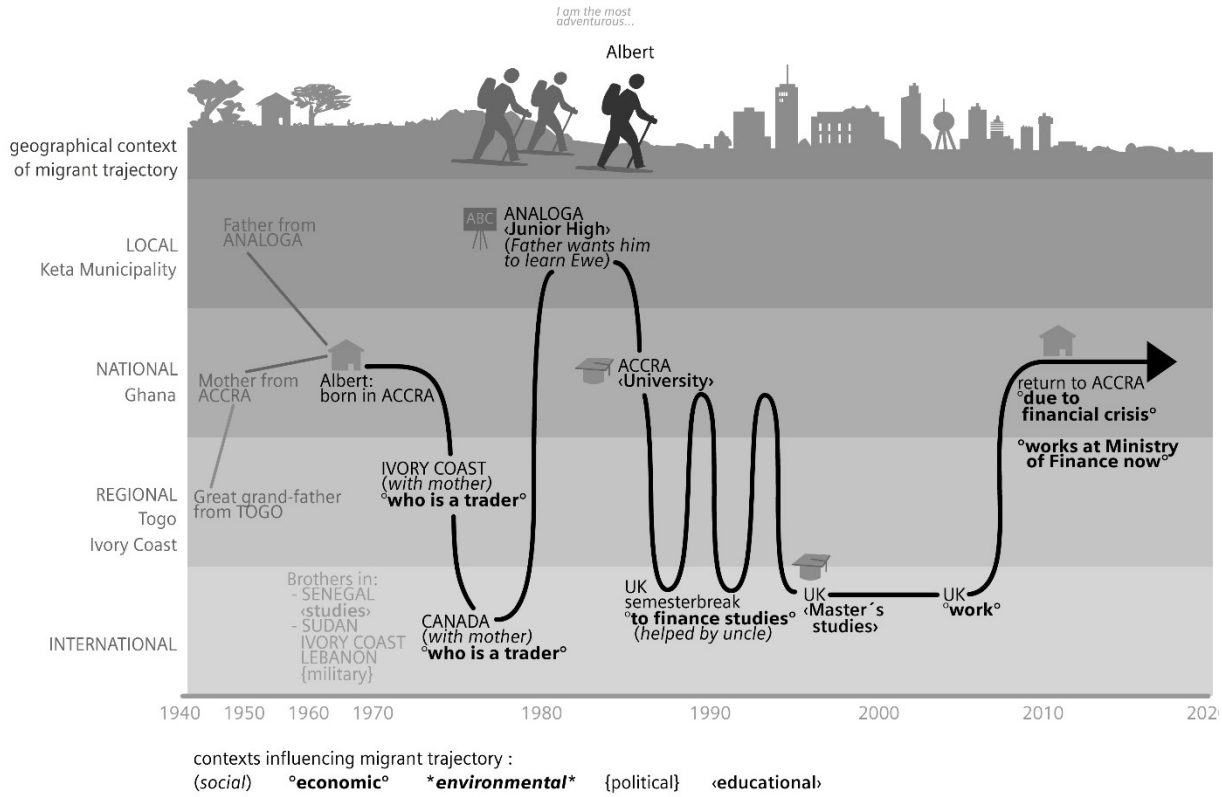

Figure 10: An international trajectory connected to the local context
Source: Concept by Ziegelmayer and Spaan, design by Piller

4.4.5 Continuum of migrant trajectories over generations

As discussed earlier, Keta as a whole, as well as individual families has a long migration history. These former migrations influence current migrant trajectories of (younger) relatives, in a chain migration fashion. One example is Ami's family with her as one key actor (Box 4 and Figure 11).

Box 4: Family related migration to Accra

After having followed her parents to many different places in Ghana due to the father's work, Ami whose mother is from Keta got the opportunity to stay in a house in Accra whose owner lives abroad. The person who took care of this house was a friend of hers. Therefore, Ami moved to Accra as the first of her family because she hoped for better work opportunities compared to Ho. Her sisters with their children as well as her parents followed one after the other. It was Ami again who managed to earn enough money from her trade to buy a land in a suburb of Accra and build a simple house on it. This is where the whole family with 16 persons is living currently. This migration to Accra influenced the migrant trajectory of Linda, one of Ami's nieces, who grew up in the family house in Keta with her mother and moved to Accra two years ago. Linda's mother organized her daughter's migration and is paying Linda's school fees for her training as a beautician.

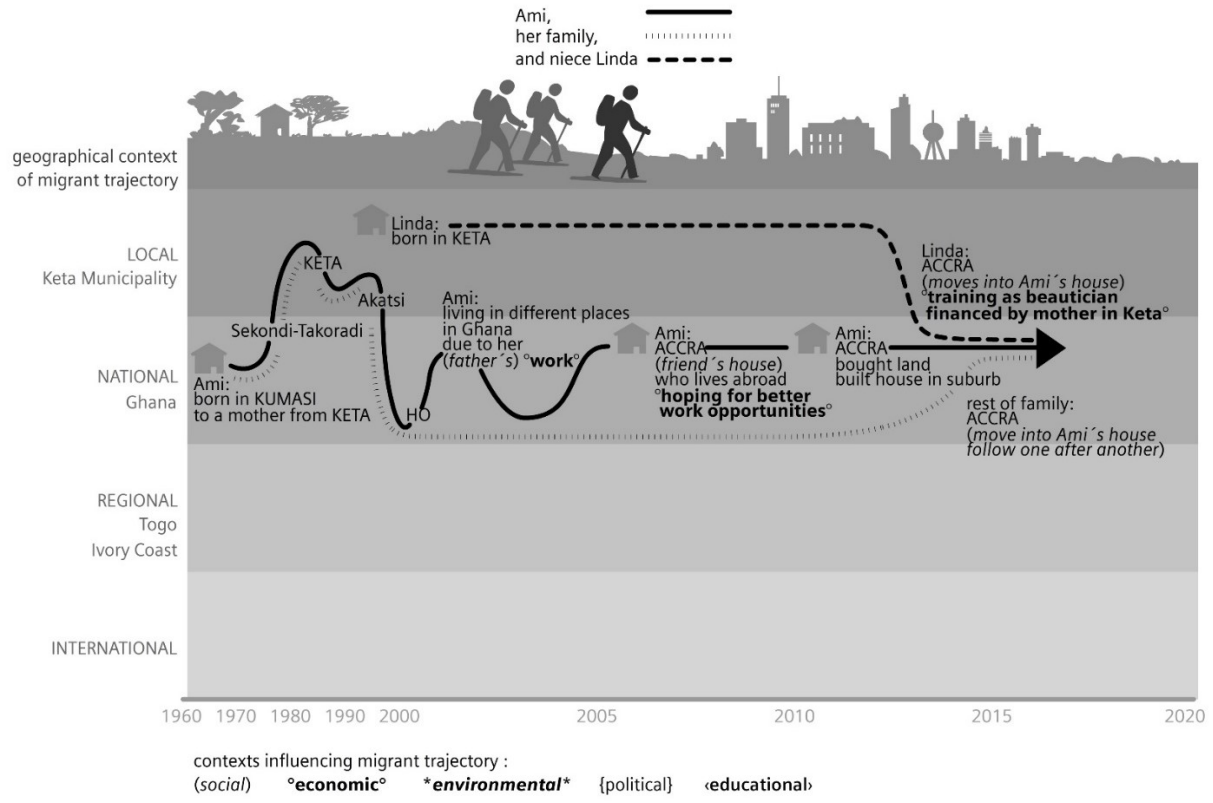

Figure 11: Family related migration to Accra
Source: Concept by Ziegelmayer and Spaan, design by Piller

This example as well as the above-mentioned cases of fishermen migration influenced by family contacts at destination, shows the importance of a family's migration history influencing contemporary migrant trajectories, thereby creating a continuum of migrant trajectories in a life history as well as in a spatial sense. On the one hand, the strong presence of migration in Keta

explains the rather positive perception of the phenomenon known for generations; on the other hand, it points to the selectivity of migration: those without contacts to migrated relatives tend to be immobile in Keta or at least find it more difficult to migrate. The following quote illustrates this:

> *… it would be of excitement for me that they [the respondent's children] would move away but with our migration; chances of migrating from this place to other places, if you do not have other relatives from here that are living there, you don't stand the chance of going there unless maybe … a government job would post you or put you there, then that would bring you happiness. (Interview with migrant household, Keta)*

4.5 Conclusion

This chapter illustrates migration as a multicausal and non-linear process, in general and in the context of environmental change. As Felgentreff and Pott put it:

> *Migration is usually a complex phenomenon with diverse causes, forms and effects. Migrants often move anyway regardless of changes in climate or environment. They have a certain agency and are not just passive victims of changes which push them around. However, their choices might be influenced by changes in their environments, especially when livelihoods depend on agro-environmental features. […] Instead of searching for one 'missing link', i.e. a determining relationship between climate and migration, the open question is: To what extent are well-known drivers of migration directly or indirectly influenced by environmental or climatic factors? (Felgentreff and Pott, 2016: 75)*

Answering this last question, our analysis of family genealogies and household interviews indicates the importance of different factors influencing migrant trajectories: the socio-cultural and educational infrastructure; the economic and political decline as an example of national policy impacting the local context, leading to a lack of jobs and subsequently initiating migrant trajectories; and the long history of migration on an individual, family and community level, which favours an image or perception of migration as synonym for progress.

Environmental changes and hazards represent an inherent part of the local context, but are only one factor influencing migrant trajectories. Whether environmental change leads to migration depends very much on the political, economic, socio-cultural and development context (see for example Castles, 2002). For instance, does national policy succeed in providing adaption measures or does, conversely, environmental change increase a political and economic decline - as in the case of Keta?

Applying the life course lens, combined with migrant trajectories shows how different trajectories and their underlying determinants are connected. Referring to Elder (1975, 1994) Kou et al. (2015), use the term 'linked lives' to grasp the relevance of one life trajectory for the trajectories of others. This concept of linked lives reminds us of our understanding of migrant trajectories as

'glue' connecting the different contexts and also being interrelated, linked at specific biographical as well as spatial points in the trajectory.

Despite the various reasons and ways of migrating from Keta, there are, however, those who either decide not to leave the area or who simply do not have the opportunity to do so. The reasons for immobility can be summarized as demographic (too old to migrate) work related (if one has established a business in Keta), cultural (where people feel attached and bound to their land and property) or related to development policies of resettlement within the municipality.

Environmental changes in this setting are shown to be related indirectly to migration and directly to short-distance movement (Jónsson, 2010). Finally, environmental changes are but one factor influencing migrant trajectories, and the way in which individuals or households react to environmental changes is a result of the interaction of the different contexts – household, local, regional, national and international. The migrant trajectory represents the link, the 'glue' connecting the different contexts.

5 “Semarang is like sugar“: on the complex relation of environmental change and migration[38]

5.1 Introduction

As an article in the Indonesian newspaper *Jakarta Post* stated in March 2018, “Indonesia is among the countries with the highest risk of being affected by climate change as many of its islands could disappear from rising sea levels.” (Jong, 2018) The south-east Asian country is among the ten countries with the highest population worldwide and consists of more than 17,0000 islands. Using the example of the coastal city of Semarang in Central Java, Indonesia, this paper seeks to understand how coastal populations in Indonesia deal with consequences of climate change.

Climate change is a major challenge for today’s societies. At the same time UNHCR reported a record number of 65.6 million people displaced at the end of 2016 (UNHCR, 2017), the highest number ever recorded.

In the media, as well as in publications authored by international non-governmental organisations (NGOs), these two phenomena – climate change and migration – are often presented as directly linked. Their shared discourse supposes that environmental or climate change leads to out-migration in affected areas. In November 2017 the international NGO *Oxfam* published a report “Uprooted by Climate Change – responding to the growing risk of displacement”. This report starts as follows:

> *Climate change is already forcing millions of people from their land and homes, and putting many more at risk of displacement in the future. Supercharged storms, more intense and prolonged droughts, rising seas and other impacts of climate change all exacerbate people’s existing vulnerabilities and increase the likelihood of being forced to move. (Richards and Bradshaw, 2017: 3)*

It seems obvious that where sea levels rise, coasts erode, rainfall becomes more erratic and desertification increases, populations are forced to move in search of safer places. Research, however, argues that the relation between environmental changes and migration is not so direct. The literature suggests a temporal distinction among environmental changes: between rapid onset environmental changes, on the one hand — such as landslides, droughts, heat waves, floods and earth quakes — and slow-onset environmental change on the other, such as desertification, soil degeneration, air pollution, sea level rise, and changing rainfall patterns. This

[38] This chapter is the fourth paper of this cumulative dissertation Ziegelmayer U (2018) „Semarang is like sugar“: on the complex relation of environmental change and migration. *artec-paper* (220) [published in journal].

temporal differentiation is often combined with the distinction between anthropogenic and natural causes of environmental change. (Hillmann, 2016) In her work on natural hazards and migration, Lori M. Hunter suggests, “that the association between migration and environmental hazards varies by context, hazard type, and household characteristics.” (Hunter, 2013: 297) She thereby stresses the non-linearity and context dependency of migration in a context of environmental hazards. Susana B. Adamo, in her work on migration and sea-level rise and flooding, stresses that permanent mass migration is not a common consequence of natural disasters; temporal migration is common in such situations. She continues, stating, “that migration is highest if damage to housing and infrastructure is combined with reduced income or working opportunities in places where out-migration was already taking place before.” (Adamo, 2013: 123)[39] This last quote refers to the crucial aspect of migration experience and history of a respective region and its populations affected by environmental and climate change.

Despite the growing number of refugees and migrants worldwide − and the growing urgency of climate change and its consequences for people around the world, especially in the Global South − academic research shows that the relation between environmental change and migration is neither straightforward nor mono-causal. Environmental change does not necessarily lead to (mass)migration[40]. Hillmann et al. (2015) argue that the debate on environmental change and climate change is somehow biased towards natural hazards like thunderstorms or cyclones, forcing many people to leave their homes (temporarily). In 1996, the migration researcher Graeme Hugo already argued that, especially in the least developed countries (LDCs), “the deeper underlying causes of environmental migration are not environmental but rather linked to political, economic, social and demographic processes.” (1996: 118).

Laczko and Piguet (2014) along with other migration researchers[41], underline that the multi-causality of migration decisions also applies to the context of environmental change. In 2010, Piguet already emphasized: “There is agreement today that natural factors are not the sole cause of migration an that the economic, social and political situations of the zone under threat can, depending on the case, increase or decrease the flow of migrants. (Piguet, 2010: 76)

[39] Both cited works of Hunter and Adamo are part of Graeme Hugo’s anthology *Migration and Climate Change* (2013) which gathers many of the most influential writings within the field of environmental change and migration.
[40] cf. Black (2001); Black et al. (2008); Castles (2002); Morrissey (2012); Mortreux and Barnett (2009)); Schraven and Rademacher-Schulz (2015); Tacoli (2009); Warner et al. (2015).
[42] The research presented here refers to Semerang City (Kota Semarang) on the Northern coast of Central Java, not to Semarang Regency (Kabupaten Semarang) which is located inland south of Semarang City.

Academic research nevertheless agrees with the above mentioned public discourse that the link between environmental change and migration exists. But it is a complex connection, not a mono-causal one, influenced by various factors in addition to environmental change. And, as this paper will show, not everybody affected by environmental change wants, or even has the means, to move.

We therefore aim to contribute to the debate on environmental change and migration using mainly qualitative data from a case study in Semarang City[42] on the Northern coast of Central Java (Indonesia). Semarang has been selected as a case study due to its long history of environmental change. It thus serves as an example of how human behaviour increasingly impacts on coastal areas and their ecosystems, as well as demonstrating the reaction of local populations to those environmental changes, especially in terms of migration and (im)mobility. As shown above, research suggests a non-linearity and non-causality of nexus environmental change and migration, but it is still very much unknown what this relationship really looks like.

As stated above, migration and (im)mobility in the context of environmental change are influenced by the given socio-economic context. Urbanisation processes are part of these socio-economic contexts and as this paper will show play a crucial role in the case of Semarang.

Migration in general is primarily internal, within one country, rather than international. This holds true for migration in the context of environmental change as well, whereas migration related to environmental factors is not only mainly internal, but likely to occur over short distances within the same country. (Laczko and Piguet, 2014; Massey et al., 2007; Obokata et al., 2014) Furthermore Laczko and Piguet (2014) underline the resilience and the different adaptation strategies of populations affected by environmental change. Migration in this understanding can be an adaptation strategy to climate change and not merely a problem provoked by climate change.[43]

Semarang is characterized by more in- than out-migration, according to official figures (Badan Pusat Statistik, 2012), and therefore puts into question the assumption that environmental changes lead to out-migration. The urban context of Semarang reminds us of Laczko’s and Piguet’s remark on migration and environmental change in urban areas:

> *In many parts of the world, towns are the main destinations for internal and international migrants, who are driven by, among other factors, environmental change. However, urban settings are often themselves vulnerable to environmental changes, such as sea-level rise,*

[42] The research presented here refers to Semerang City (Kota Semarang) on the Northern coast of Central Java, not to Semarang Regency (Kabupaten Semarang) which is located inland south of Semarang City.
[43] Cf. Tacoli (2009); McLeman and Hunter (2010); Ziegelmayer et al. (forthcoming).

> *landslides and hurricanes, with the result that migrants may find themselves in a vicious circle of vulnerability. (Laczko and Piguet, 2014: 16f)*

Based on the assumption that the relation between environmental change and migration is neither linear nor mono-causal, the main research question for this paper is the following: who moves from and who stays in coastal Semarang, a place affected by various environmental changes, and why? We furthermore aim to understand how people affected by environmental change in Semarang decide whether to move or to stay. What are the influencing factors? Semarang serves as a showcase for the complexity and non-linearity of the relationship of environmental changes and migration. Despite various environmental changes, there are more people moving to Semarang than leaving. The assumption of environmental change leading to out-migration does not seem to hold true for the case of Semarang. But why? Finally, we also aim to analyse who moves into coastal Semarang, despite environmental changes, and we ask why these people arrive, and stay.in

5.2 Study area Semarang City: migration and (im)mobility in a context of environmental change and urbanisation

The context of Semarang shows that in areas of slow-onset environmental changes, such as erosion, sea level rise (SLR), salinisation and land subsidence, do not forcibly lead to (massive) out-migration. On the contrary, some people move, but often not very far or only temporarily; some stay; and a third group of people even migrate into those coastal areas affected by environmental changes. Interconnected with environmental changes, several other factors influence migration decision making and (im)mobility.

Semarang has a population of about 1.5 million and is the fifth largest city in Indonesia. It is located at the Northern coast of the Indonesian province of Central Java. The city has been an important trading hub since colonial times. Semarang was founded in 1547 as a trade and port city. The city back then was composed of indigenous Javanese settlements, a Chinese population, as a well as a Dutch fortress. It was only in the mid-18th century that the city gained importance as a trading spot for commodities from other islands to be exported via Semarang’s port. At that time, Semarang attracted many foreigners (Dutch, Chinese and East Asian) who migrated there as traders, leading to rapid population growth and making Semarang the third largest harbour on the island of Java. (Setioko, 2010) Still today, the port connects Semarang to other Indonesian islands as well as to international locations. Nowadays the port itself, as well as the neighbouring coastal industrial area, attract many workers from neighbouring regencies.

Semarang is also attractive to investors due to its port and its various industrial, service and manufacturing companies including the textile industries mentioned above. Furthermore, Semarang is home to numerous universities and other educational facilities, and therefore represents an important destination for students from the surrounding areas.

Semarang City is part of the “Semarang Metropolitan Area” (SMA), or Greater Semarang “Kedungsapur,” which includes Semarang City, Salatiga, Semarang Regency, Kendal Regency, Grobogan Regency and Demak Regency. It is one of the national strategic growth areas defined by the Indonesian Government in 2011 in its “Masterplan for Acceleration and Expansion of Indonesia's Economic Development” (abbreviated MP3EI). The area counted about 5.4 million inhabitants in 2010.

Referring to Gilbert and Gugler (1991), Handayani and Kumalasari (2015) point to the strong influence of international capitalism leading to “peripheral urbanisation” in Indonesia and many other Asian developing countries. The authors refer to the important role of multinational corporations, e.g. manufacturing industries that largely influence urban growth in Asia. This holds true for Indonesia and Semarang as well, where textile factories represent an important employer for migrants from the surrounding (rural) areas, as the case of female in-migrants to Semarang presented in this paper shows.

Handayani and Kumalasari (2015) underline the “significant gap in the standard of living, facilities provision and most of all employment opportunities” between Semarang and the surrounding (rural) areas to explain population movements linked to coastal industrial development.

Urbanisation is playing a major role in Semarang and its surroundings. As in other urban areas around the globe, urbanisation rates in Central Java are constantly rising: “40.4 percent in 2000, 56.2 percent in 2010” and projected rates of “73.8 percent in 2025” (Indonesian Statistical Bureau, 2010, cited in Hillmann and Spaan 2017: 41). Compared to 1971 when only three Indonesian cities were categorised as metropolitan cities (Jakarta, Bandung and Surabaya), in 2010 there were already 14 metropolitan areas, including Greater Semarang with a total population of 6.5 million.

If one looks at the settlement history of Semarang, one realizes that some of today’s environmental problems in the coastal areas are closely linked to how and where people settled. Figure 12 shows clearly how the coastline moved within the last 300 years due to sedimentation and how it grew “into the sea” as settlements were built on wet land and alluvial soil. In addition

to these settlements on wet land, there have also been some reclamation projects e.g. Marina Bay next to the harbour where land was “reclaimed” from the sea to build residential areas.

Figure 12: Semarang's coastline from 1741-2007 (Helmi, 2014)

In addition to these settlements in the coastal wetlands, the topography of Semarang, with a low lying coastline in the North, where the majority of the population lives, and a steep mountain area in the South (Helmi et al., 2014) exacerbates the risk of flash floods along the rivers and tidal floods at the coast (Anita and Latief, 2013; Marfai et al., 2008). Population figures for “low elevation coastal zones” (LECZ)[44] are between 400 and 600 million people worldwide. (Anthoff et al., 2006, cited in Piguet, 2010: 80) This, however, does not mean that all those people will migrate in the future. (Piguet, 2010) In Semarang almost 840,000 live within this LECZ. (Mulyana et al., 2013b) In Semarang this situation is worsened by increasing transformation of forests into settlements at higher altitudes, reducing the soil’s capacity to absorb rain water in those areas. Additionally, since the 1990s, mangroves along the coast were destroyed in great numbers in order to create fish ponds and shrimp farms, thus destroying an important natural form of coastal protection.

According to the NRF survey, 36 percent of the interviewed households had already experienced river flooding (*banjir*), 17 percent had experienced tidal flood *(rob*) and 8 percent of the interviewed

[45] Design: Ziegelmayer and Hillmann, Graph: Kartographieverbund TU Berlin; migration data according to BAPPEDA and BPS Kota Semarang 2012: xiv; data on settlement areas and flooded areas according to Helmi 2014.

households have experienced land subsidence. Hillmann and Spaan (2017) describe that various environmental changes in Semarang’s coastal areas negatively impact the livelihoods, social networks and health of the populations concerned. Referring to Mulyana et al. (2013b), the authors emphasize the importance of successful coping mechanisms and of the level of vulnerability in determining how households are affected by environmental changes. It is not only their financial income that counts. (Hillmann and Spaan, 2017)

Handayani and Rudiarto’s work on suburbanization in Semarang (2014) indicates how the city expanded, despite the risk of flooding, within the last decades (Figure 13). Today’s urbanisation comes with rising groundwater extraction, especially in the densely populated coastal areas, leading to a worsening of land subsidence (Marfai and King, 2007, Marfai et al., 2008). The yearly rate of land subsidence is between 2 and 10 cm per year, sometimes going as high as 16cm. (Marfai and King, 2008)

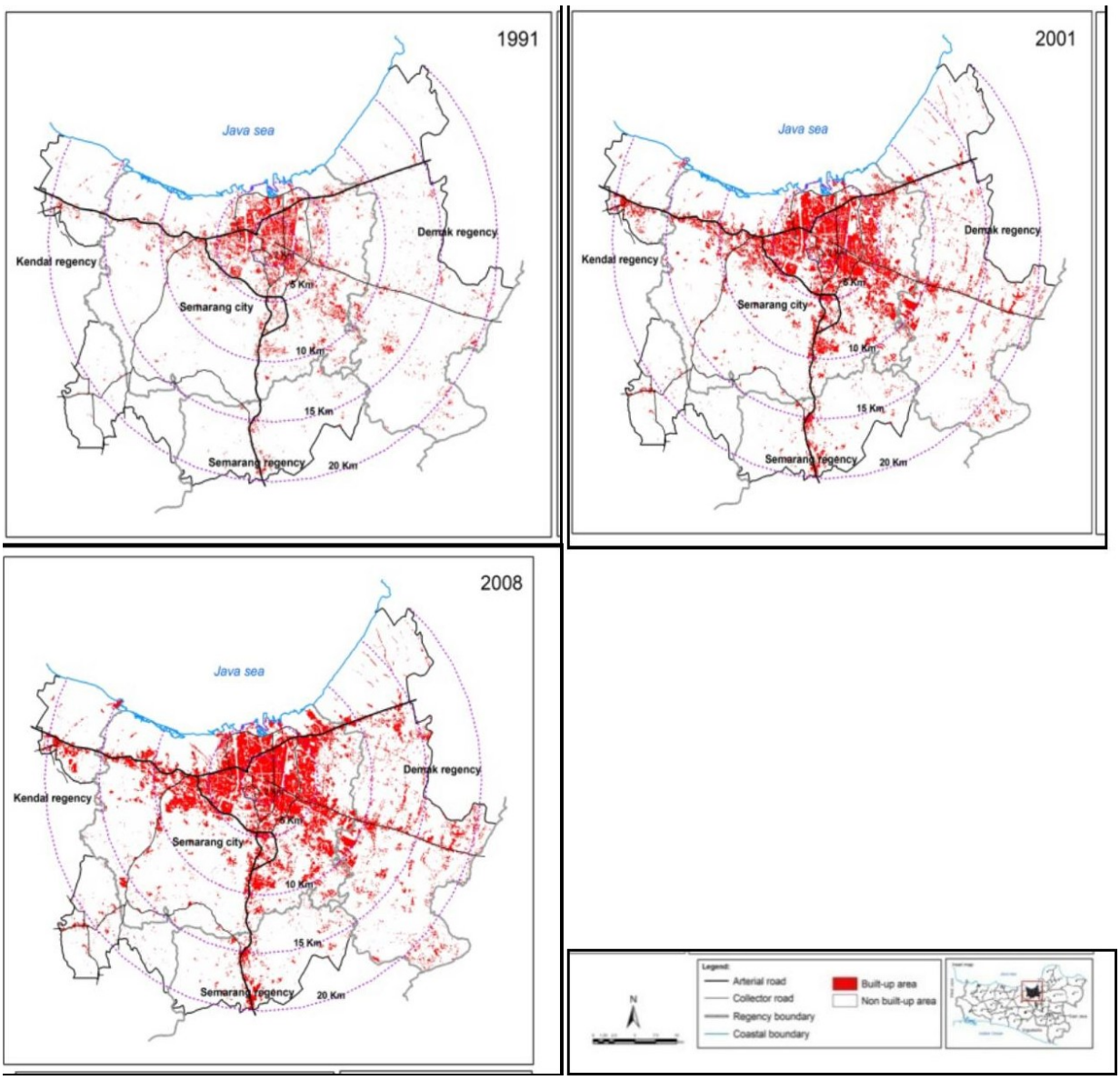

Figure 13: Built-Up Area Expansion of Semarang Metropolitan, 1991, 2001, 2008 (Handayani and Rudiarto, 2014: 84)

Since the 1990s urbanisation in Semarang led to transformation of former forest land in the southern areas of the city at higher altitudes into settlement areas. These areas serve as settlement for newcomers from places outside Semarang (who are often economically better off), as well as for those who can afford to leave the coastal areas and buy a new house in these southern parts of town. In this context, that of a growing city, those who decide to leave the coastal areas (due to environmental changes) would rather move to other parts of town than leave Semarang completely.

Despite the risks of SLR, erosion and flooding, the city with its port, industries and service sector, as well as manufacturing and aquaculture, represents the core of the above-mentioned Semarang

Metropolitan Area SMA (Kedungsepur). As Hillmann and Spaan (2017) point out, an urban corridor has recently connected Semarang to Yogyakarta on the southern Coast of Central Java.

Semarang experienced a yearly population growth of 1.4percent in 2010, higher than the neighbouring regencies of Demak in the East, Kendal in the West and Semarang Regency in the South. These statistics reflect? the importance of in-migration for Semarang, despite environmental changes, as well as increase due to natural population growth. (Mulyana et al., 2013a)

As Hillmann and Spaan point out, the majority of migration movements within Indonesia are directed “from the outer islands to the coastal urban centres on Java” (2017: 32). This puts the urban centres under pressure in terms of infrastructure and environment. (ibid.)

Central Java is g traditionally a region of out-migration; Semarang is the only city, among all regencies and cities in the province that indicates a positive net-migration. (BPS, 2012) Semarang’s neighbouring regencies report more out-migration than in-migration, an indicator for rural-urban migration to Semarang.

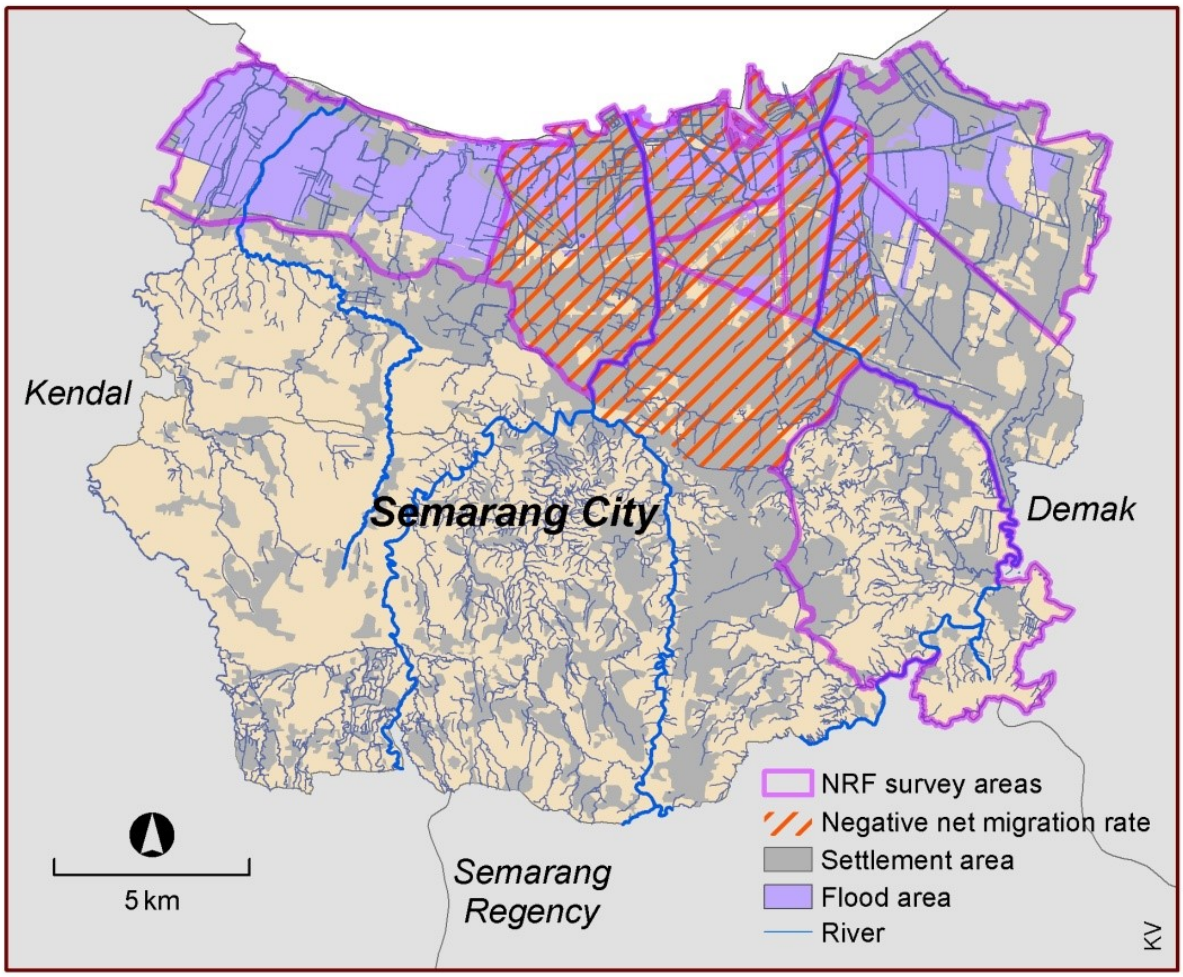

Figure 14: Map study site Semarang[45]

If one looks more closely at Semarang’s net-migration rate on a sub-district level, one realises that half of the 16 sub-districts report a negative net migration rate (Bappeda and BPS Kota Semarang, 2012). Those sub-districts are located in the core area at the coast and in the city centre (see Figure 14), an indicator for internal movements within Semarang from the core to the peripheral areas. Setioko (2010) explains this “suburbanization” as the movement of universities, government offices as well as shopping facilities and industries to the fringe areas, leading to an unbalanced population growth.

Semarang’s working population is mainly employed as industrial workers (25 percent), construction workers (13 percent), government employees/armed forces (16 percent), services (10 percent) and farmers (5 percent). The city is an important centre for trade, hotels and

[45] Design: Ziegelmayer and Hillmann, Graph: Kartographieverbund TU Berlin; migration data according to BAPPEDA and BPS Kota Semarang 2012: xiv; data on settlement areas and flooded areas according to Helmi 2014.

gastronomy in the region. About a third of its population lives in poverty, with substantial differences within the city. (Mercy Corps, 2010). The majority of the population of Semarang is of working age: 70 percent are between 15-59 years old, 24 percent under 15 years and only 7 percent older than 59 years[46]. This population distribution might partly be explained by on-going in-migration of migrant workers from surrounding rural areas into the city.

Coming back to the importance of the socio-economic and historical context for migration decisions, one should keep in mind that in Semarang “Environmental change is [...] not a new phenomenon, but is part and parcel of [...] livelihoods [...] for generations; thus the importance of environmental change as a driver of mobility should not be overstated, but be rather seen as one underlying factor influencing household livelihood strategies, next to other factors.” (Ziegelmayer and Spaan, 2018)[47]

5.3 Methodology

This paper is based on data collected during fieldwork in Semarang (Indonesia) in 2014 and 2015: a quantitative household survey (NRF Survey; n=333) that serves as background information for this paper[48] and qualitative semi-structured interviews with migrants households in Semarang (n=26), as well as migrants from other places living in Semarang (n=16) and experts (n=09). The experts interviewed were researchers from the department of Anthropology at Diponegoro University in Semarang working on migration in Semarang, as well as representatives of the city administration working on adaptation measures to climate change in Semarang. This paper primarily draws upon the qualitative interviews.

The fifteen *Kelurahan*[49] for the household survey were selected from among those most affected by environmental changes as well as those characterized by high in- and out-migration according to the 2010 census[50]. From those *Kelurahan,* three were selected for the qualitative interviews: Rejosari, Panggung Lor and Tanjung Mas. This selection was based on high in- and out-migration according to the NRF survey and on the relatively high prevalence of tidal and river flooding. The

[46] Own calculation based on 2010 Population Census Data - Statistics Indonesia.
[47] This quote refers to research on migrant trajectories in a context of environmental change in coastal Ghana as part of the same NRF research project.
[48] For a more detailed analysis of the quantitative data of the NRF Survey in Indonesia and Ghana, please see Hillmann and Ziegelmayer, 2016.
[49] *Kelurahan* is an administrative sub-division in Indonesian cities that represent “urban communities”. Semarang City consists of 16 *Kecamatan* (sub-district) and 177 *Kelurahan*.
[50] The data for this selection is based on the census 2010, “Semarang in Figures 2012” and publications on the different Kecamatan in Figures 2014.

households for the qualitative interviews were selected from the survey sample based on the migration experience of the household as a whole and its members. In addition to household interviews in those three *Kelurahan*, interviews were conducted with households that had moved away from those *Kelurahan* to another area of Semarang (n=08).[51]

5.4 Leaving or staying...: insights into migration decision making in Semarang

The question of who decides to move and who decides to stay, despite constant problems with flooding and land subsidence, depends on various factors.[52]

The NRF survey confirms this picture of Semarang as not being affected by massive out-migration, as one could suppose due to the various environmental stresses. The survey indicates that 54 percent of the interviewed households have always lived at their current place of living. Out of those who moved to their current place, 28 percent previously lived elsewhere in Semarang, indicating internal migration within Semarang. The survey confirms the dominance of rather short distance and internal movement even within Semarang: 32 percent of migrants from the interviewed households moved within Semarang, 47 percent moved to other places in Java – the majority of them staying in Central Java, 16 percent to other Indonesian islands and only 4 percent to other countries[53]. Instead of moving as a whole household, quite a high number of interviewed households reported out-migrants among their members: 39 percent had 3 to 4 household members that moved away. The reasons for their movement were mainly family (59 percent) or work (32 percent) related. Seven percent moved because of educational reasons. The profile of the out-migrants is rather gender balanced according to the survey, with 76 percent being between 20 and 39 years old, meaning of the age at which people typically marry and look for work elsewhere. Quite surprisingly, less than half of the migrants contribute to the household income of those who stayed in the coastal area (38 percent send money, 5 percent send money and goods), whereas 56 percent do not contribute to the household income at all. On the other hand, it was only a third of all out-migrants that received assistance from the household members

[51] As during the field research many respondents stated that people had left their *Kelurahan* due to environmental changes but were not able/willing to give out contacts of those people, the migration data at the *Kelurahan* offices in Rejosari, Panggung Lor and Tanjung Mas were analysed in order to identify the *Kecamatan* to which most people had moved. Following this analysis five households were selected in the *Kecamatan* accounted for most migrants by *Kelurahan*. (from Panggung Lor to Semarang Barat, from Rejosari to Pedurungan; von Tanjung Mas to Genuk). These interviews are referred to as “migrant HH within SMG”.

[52] For a discussion of the difficulty to distinguish between environmental and other economic, social, politic etc. factors leading to migration see Felgentreff and Pott (2016); Tacoli (2011).

[53] 1 percent of respondents did not know where the out-migrants of the household had migrated to.

for their migration. Finally, the NRF survey confirms the perception that migration of one household member is not necessarily positive for the household: 46 percent disagree that a household with migrants living outside Semarang is better off, while only 28 percent agree with that perception. These figures indicate that, in contrast to other regions, in Semarang, neither migration of the whole household nor sending a household member into migration seem to be a common adaptation strategy to diversify household income and lessen the burden for the household.

The limited migration experience of the interviewed households is in line with the fact that Semarang has not been a priority area for the governmental resettlement program “transmigrasi,”[54] which mainly aimed at resettling people n from the very populated Java Island to other Indonesian islands. In Central Java, most workers came from Cilacap (2014: 16,017), followed by Kendal Regency (2014: 11,216), west of Semarang. Semarang itself only counted 395 workers participating in the transmigrasi program in 2014 (figures provided by the Department of Labour, Transmigration & Citizenship in Semarang)[55].

Households affected by environmental change in coastal Semarang do not just pack all their belongings and leave the area, but rather balance reasons for staying with those for moving. The interplay of environmental change and migration in Semarang is presented here in three categories: in situ adaptation, internal migration within Semarang City and finally in-migration into the coastal areas.

5.4.1 In situ-adaptation

Based on the analysis of the qualitative interviews, three types of explanations for “in-situ adaptation” can be derived from the interview material: financial and economic considerations “strategic” reasons, as respondents termed them and socio-cultural reasons.

Among the economic and financial factors influencing migration decision-making in a context of flooding, and especially of land subsidence, one prominent factor is the costs of constant renovations, such as raising the floor, or even the whole house, to protect it from flooding. These financial burdens lead to several possible consequences: either the household head decides that

[54] First introduced by the Dutch colonial administration (1905-1941), the so-called transmigrasi program aimed at reducing the number of inhabitants on the main island Java by populating outer islands with Javanese people. After independence in 1950 the Indonesian government initiated its own transmigration program, initiating also voluntary migration (Fearnside, 1997). The program was criticised by NGOs stating it did not reduce population pressure in Java, but rather provoked social and political conflict on the outer islands.

[55] Unfortunately, the Department of Labor, Transmigration & Citizenship in Semarang did not provide figures for previous years to the author.

his/her family will stay because they have already invested a lot in renovations and adaptation measures, or they decide to move because they cannot or do not want, to invest in the coastal house again, but prefer to spend their money on r another house in a flood-safe area.

Picture 2: House in Kel. Panggung Lor whose floor had been lifted for 3m in total. (Picture: Ziegelmayer 2015)

Picture 2 shows a respondent’s house, the floor of which he had raised three times, each time one meter. The house is located in Kelurahan Panggung Lor, a coastal sub-district of Semarang with a rather economically better-off population. The respondent explained that he financed the renovation measures in his house himself and that he chose a wooden structure for the roof that can be lifted up easily. Asked whether he ever thought of moving away, he answered that he likes the neighbourhood, its strategic location and that he would not get enough money for the present house to buy a comparable one elsewhere. The road in front of the house has been lifted four times (two meters in total) and was financed by a cooperative of the inhabitants of Panggung Lor. This cooperative, called “P5L,” (*Paguyuban Pengendali & Penanggulangan air pasang Panggung Lor*) was founded in order to fight against tidal flooding and succeeded in building nine pump houses to pump water out of the area. Those pumps are still active today and the households in

Panggung Lor pay a monthly contribution to P5L depending on their income and the size of their house (25-75.000 IDR /month)[56].

P5L is a good example of how inhabitants with some financial means can succeed in organizing themselves to finance in situ adaptation measures to ongoing environmental changes in their area. In the two other analysed sub-districts, Tanjung Mas and Rejosari, there was no such formal initiative by inhabitants, indicating how the capacity to adapt depends on financial resources. Tanjung Mas and Rejosari are home to poorer households than is Panggung Lor in general. In those areas, on the contrary, the local government financed the raising of some roads and public places, such as markets.

Van der Zwaluw confirms the importance of social relations and networks in encouraging coastal populations in Semarang to stay. Her research was conducted in Kemijen, a *Kelurahan* in North-East Semarang next to Tanjung Mas:

> *The interviewed inhabitants with relatively more financial resources mostly preferred other adaptation strategies than migration. Heightening of the house seems to be a more preferable option than saving money in order to be able to move to another area.* ***The respondents considered moving as an expensive option.*** *The interviewed inhabitants who did not move but had enough money stayed either because it was cheaper to heighten the house or because they wanted to maintain their social position. (van der Zwaluw, 2013) ; emphasis by the author)*

Those examples refer to homeowners However, there are also respondents who lived in rented houses and still considered the financial aspect of environmental changes. They often argued against in situ adaptation and moved to avoid future rent increase once the landlord renovates the house again to protect it against flooding.

> *Because if I keep staying in Kebon Harjo, the house might always need to be lifted up. Maybe in three or four years, the flood could reach the house so the owner needs to lift up the house again. It surely will make the rent cost increase as well. (Interview migrant HH within SMG)*

According to the NRF survey, almost half of the interviewed households had lifted their house’s floor at least once, on average about five years before and mostly one or two meters higher. This indicates that raising the floor of one’s house is a crucial adaptation strategy among coastal populations.

To summarize, those who own a house prefer to invest in adapting it to flooding rather than moving away. Those who rent prefer to move if they have the means to prevent higher rents that might result from to adaptive measures taken by the landlord.

[56] In July 2015 (time of the fieldwork) 1.70€- 5.17€.

As stated in the beginning, not everyone moves out of coastal Semarang because of environmental problems. Among those who stay, their reasons differ.

There are those who simply do not have (financial) means to move or to renovate their coastal house; they could be referred to as “trapped populations” (Black and Collyer, 2014). Laczko and Piguet (2014: 16f) refer to "those left behind": these are the populations who might be “the worst affected by climate change,” affected more intensely than the migrants themselves.

One example is a respondent in Panggung Lor who never considered moving away because “I didn’t have enough money.” (Interview out-migrant’s HH Panggung Lor) He considered the place where he is living cheaper than the costs of a possible movement. His children, however, moved out, one by one, to study or work elsewhere. In the same way that it is difficult to estimate how many people left the coastal areas due to environmental change, it is difficult to estimate how many people should be considered as “trapped” in Semarang. The NRF survey for example shows a monthly average income for 41 percent of the interviewed households of 1 - 2,5 million IDR and only 500,000 to 1 million IDR[57] for another 26percent of the HH. Official figures for 2016 indicate that 4.85 percent of Semarang’s population were living in poverty in 2016.[58]

Another respondent states, when asked about the difference between those who decide to move and those who decide to stay:

> *R1: There is a difference. Probably they don’t move, not because they don’t want to, but because they can’t afford a new place. Although they sell the old house, the money they get is not necessarily enough. We were also doubting whether or not moving out was the best choice. But then we realized that if we don’t use the saving soon, it would be just used up on a rented house. […]*
> *UZ: And according to you, why some people don’t want to move away?*
> *R1: One is because they lack money, and the other one is because that’s the place where they earn their living. Maybe they work there, or have a shop there and they have already gained their regular customers, so it’s hard to just leave and start over the business in the new place. (Interview migrant HH within SMG)*

This last quote indicates another reason why people might decide to stay in the coastal area despite environmental problems: their livelihoods depend on the coastal areas. Many respondents used the term “strategic location” to refer to coastal Kelurahan, in order to explain why they stayed there. Living near the coast means living close to the sea for the fishermen, close to the harbour for those working there, close to the factories, for example those of the textile industry, for workers, close to the market for those working as traders or porters and, finally, close to the train station, as well as the airport, for those whose professional activities require mobility. One respondent in

[57] 68-157€ and 34-68€ (July 2016).
[58] Bappeda Kota Semarang and Badan Pusat Statistik (BPS) Kota Semarang (2017): 155.

Panggung Lor enumerates all the important types of infrastructure which qualify Panggung Lor as a “strategic location”:

> *[…] usually the people who have stayed here for ages would stay still, because, regardless the flooding, this area is very strategic for staying in. The airport, the station, hospital, market are all close and reachable easily from here. (Interview out-migrant’s HH Panggung Lor)*

Those who mention “strategic location” in their explanations of why they stay, despite flooding and land subsidence, are mostly living in the economically better off Kelurahan Panggung Lor. They often have the financial means to adapt, by for example, lifting their house so as not to be bothered by indoor flooding.

Besides strategic and financial considerations, there is of course also a social aspect to the decision of whether or not to leave one’s house in the coastal area. Some respondents state that they still stay in their house despite flooding because it is a family house, representing an inheritance from loved ones which they do not want to abandon. Another social, or even spiritual, explanation is especially relevant to the ethnic Chinese of Semarang, many of whom live in Kelurahan Panggung Lor. This population group often believes that living near the water brings fortune and good luck in business, a perception influenced by Feng Shui principles. This is one reason why many Chinese stay in the coastal area despite flooding. Those who have the financial means keep their house near the coast, but live in another house in a flood-safe area:

> *R1: It’s because the Chinese normally like to live in a group. And it was said that they indeed prefer to live near water source like the sea because they believe it will bring them fortune.*
>
> *UZ: But as for you, you think that it’s better to move than to have to always face the flooding?*
>
> *R1: Of course. But the Chinese who are rich normally have another house in other places aside from one in Tanah Mas.*
>
> *UZ: But they still stay at the house in Tanah Mas?*
>
> *R1: Yes. They don’t sell the house. […] There are also Chinese among them who moved.*
>
> *UZ: But they don’t sell the house, do they? So they could come back anytime.*
>
> *R1: Yes, if they are wealthy enough. If that’s the case, they indeed would normally leave the house to be used by relatives or to be rented. Otherwise, if they’ve only got a few excess of money, they would rather leave the house for sale and then buy a new one elsewhere. […] (Interview HH MM SMG (SMG Barat))*

In addition to this reasoning, special to Semarang’s ethnic Chinese, there is a strong attachment to place, family and livelihood among the Javanese coastal population. Handayani and Kumalasari (2015) cite the Javanese value of *“mangan ora mangan ngumpul”* meaning “in bad or the worst conditions, sticking together with all family members is the most important thing.”

It is not only the attachment to place that motivates coastal people to stay, but the perception of flooding by the coastal populations in Semarang also plays a role. Van der Zwaluw (2013) suggests in her work on Kemijen in North-East Semarang that the inhabitants do not necessarily see water in the area as flooding and as an insurmountable threat. This is, on the one hand, due to the fact that regular (tidal) flooding has become a part of their daily life and, on the other hand, it is due to factors relating to income. Inhabitants who have the financial means to lift their house and thereby protect themselves and their belongings might not see flooding as an urgent risk. It is therefore not only the objective height and frequency of the flooding, but also the (financial) means of the populations to protect themselves against it, that determines their perception of flooding and there, in the long-run, their decision to move or to stay.

Goldbach confirms that respondents perceive the tidal floods that occur on a regular basis (not like sudden-onset flooding) “as less severe, since streets and houses are regularly inundated for a shorter period of time without threatening health or lives.” (2017: 26) She continues, stating:

> *Erosion and subsidence have also been experienced for several decades already with the result that their impacts are not new for respondents in those regions. Furthermore, the great majority of people in Semarang adapts to constant subsidence and the concomitant inundation threats by lifting houses, floors and valuables, building drainages, and similar. (ibid.: 26f)*

A Javanese saying even equates the city of Semarang with flooding, illustrating how coastal populations are used to live with the flooding. (Fieldnotes, 29.06.2015)

Finally, another element that explains why environmental change in Semarang is not followed by (massive) out migration might be the above-mentioned historical context: the migration history and experience of affected populations. As a coastal port city, Semarang has attracted in-migrants since colonial times, but, as the example of the transmigration program shows, the city has never been a major location of out-migration. This limited familiarity of Semarang’s population with out-migration, as well as the fact that those who migrate to Semarang in search for work accept difficult environmental living conditions, is certainly part of the explanation of why Semarang’s population is rather immobile, of why, when people do migrate, they do so over relatively short distances and in relatively small numbers.

5.4.2 Internal migration in Semarang

Picture 3: House sunken below the road and abandoned by its inhabitants, Kel. Panggung Lor (Picture: Ziegelmayer 2015)

The interviews indicate – especially for households affected by river and tidal flood and land subsidence – that those who decide to leave the coastal areas of Semarang do not migrate out of the city completely but, rather move to parts of town that are not affected by those environmental changes, especially to upland areas in the southern part of the city:

> *UZ: Would you say there are many people who moved away because of the flooding?*
> *R1: Yes. Around here there were three families who moved, whereas in Gang Enam [street 6], almost half of the inhabitants moved out.*
> *UZ: And where did they move? Do you know?*
> *R1: To another part of Semarang City.*
> *T: They chose the place where they could avoid the floods?*
> *R1: Yes. My sisters and brothers also suggested me just moving out and selling this house. However, this house wouldn’t make much money so it would be difficult to buy another house in the new place. (Interview out-migrant’s HH Panggung Lor)*

The perception that many inhabitants moved because of the flooding is shared by other inhabitants of Panggung Lor. Furthermore, the statement strengthens the argument that the majority of environmental change-related migration in Semarang is directed towards geographically proximate areas, that is to other sub-districts of Semarang, preferably those that

are further from the coast and therefore not prone to flooding. This is congruent with the above-mentioned research on short-distance migration in contexts of environmental change. These findings also underline the extent to which migrant trajectories in Semarang are embedded in urbanisation processes. As the flooding in Semarang’s coastal areas is not only a problem during the rainy season but is a problem throughout the year due to tidal floods, temporary migration, such as seasonal migration, was not mentioned as an adaptation strategy by respondents. Those who move, although they often not move far, move permanently.

Finally, the quote shows how residents of the coastal areas threatened by flooding balance reasons that weigh for and against moving, juggling the potential benefit of moving (being safe from flooding) with the financial loss that would result from being unable to t sell their homes at a good price. The latter might cause difficulties to buy a comparable house in another part of Semarang and is even more difficult when house prices are falling in the coastal areas due to flooding and land subsidence. As Semarang as a whole experiences more in- than out-migration, the city is booming, rents and house prices are rising. This situation makes moving from coastal areas to other sub-districts even more difficult for poorer households from the coastal areas because of high house prices in the potential destination areas. This is due to the above-mentioned urbanisation processes, including the development of new settlements in the fringe area that are not affordable for poor populations.

During the fieldwork, many respondents stated in one way or the other that “there were many who moved away from the coastal areas to other parts of Semarang because of the flooding.” It was, however, very difficult, not to say almost impossible, to trace those internal migrants in Semarang. Due to lack of data and information, it is hard to know approximately how many people moved primarily because of environmental changes. For the same reasons, it is difficult to know with any specificity when they moved. As stated above, migration rates on a Kecamatan (sub-district) level, however, show that half of the sub-districts, those located at the coast and in the city centre, have negative net-migration rates (see Figure 14). Population growth on a Kecamatan level between 2009 and 2013 shows that while the whole of Semarang experiences a slowly decreasing population growth of around 1-2 percent (1.7 percent in 2009; 1.4 percent in 2010; 1.1 in 2011; 0.96 percent in 2012 and 0.83 percent in 2013), there are three Kecamatan that consistently experienced negative population growth during that period (Semarang Selatan; Semarang Timur and Semarang Tengah). Those three Kecamatan are part of the above mentioned Kecamatan in the core and coastal area of Semarang that experience a negative net-migration rate. (own

calculations based on (Badan Pusat Statistik (BPS) Kota Semarang, 2010, 2014; Bappeda Kota Semarang and Badan Pusat Statistik (BPS) Kota Semarang, 2009, 2011, 2012b, 2013)

All respondents agreed that most movements out of the coastal area were directed to other parts of Semarang, not further away. These movements however mostly concern households with a higher income that can afford new houses in the new suburbs.

Migration data provided by the three Kelurahan offices where the household interviews were conducted indicate that most people from a particular Kelurahan simply moved to a neighbouring Kecamatan: People from Panggung Lor moved to Semarang Barat, also located on the coast; those from Tanjung Mas and Rejosari, both economically worse off than Panggung Lor and Semarang Barat, moved to Kecamatan in the fringe area[59]. Box 5 presents an example of migration within Semarang and serves as a showcase for a complex decision making among household members, balance environmental change with the possibilities of internal migration. Their movement was not linear nor was the decision-making mono-causal.

The majority of the interviewed households who had moved within Semarang shared experiences with environmental problems, mainly flooding at their former place of residence. They, however, rarely considered these environmental problems to be the main reason for their move. The move was, rather, explained by either financial problems which forced them to sell the former house; family related issues (taking care of a sick parent or wanting to have one’s own house as a young couple); or by eviction, due to conflicts over land tenure. All of those households shared an experience of several prior relocations within Semarang. According to the respondents, however, it was not the environmental problems in the coastal area that initiated their first move (or relocation).

Another respondent observes that, for example, those house owners who decide to leave the Kelurahan Rejosari in central Semarang − a Kelurahan not located on the coast and that is mostly suffering from river flooding − are not able to sell their houses but nevertheless move away, leaving the houses abandoned:

> *[…] many people moved away from this area. However, if the movement was caused by flooding, they would mostly just abandon the house. That’s why many houses are left empty, particularly in Purwosari [North Semarang]. (Interview out-migrant’s HH Rejosari)*

[59] Inhabitants of Rejosari in the city centre near the river had moved to Pedurungan in the east part of town and inhabitants from Tanjung Mas near the harbour had moved to Genuk still at the coast but on the east fringe area.

Box 5: Migrant trajectories within Semarang[60]

Ibu Helmia moved with her husband and children from Kelurahan Rejosari to Kecamatan Pedurungan in the eastern part of town far from the coast, the latter not affected by flooding. She used to live in Rejosari in the house of her parents-in-law, with them as well as with two of her husband’s siblings and their families. However, she recounted that, “Since the house always got flooded, my husband decided to rent a house for me and my children in Mangkang. My husband kept staying in Rejosari. But on Friday afternoon, he would come to Mangkang.” With Mangkang in North-Western Semarang being quite far from the husband’s workplace, he continues s to live in his parent’s house – accepting the constant flooding – while his wife and children moved to Mangkang. Later, the mother-in-law decided to sell the family house in Rejosari and to divide the amount she got among all of her children who did not yet have not their own house. The decision to sell the family house was also influenced by the constant flooding according to the respondent. The timing of the move was chosen in order to avoid expending additional money by again lifting the house

> *The flooding was one of the reasons [why the mother-in-law sold her house]. Furthermore, the mother was already very old and she was alone in the house. The family then held a meeting and it was decided that they better sold the house soon. If not, the house would possibly need to be lifted up again next time which surely would cost quite a lot of money, while the mother’s income was solely from her late husband’s pension.*

It is with this money from the sale of the house that Ibu Helmia and her husband are able to pay for the current house in Pedurungan (periphery in Eastern Semarang), in instalments. After some time in Mangkang, they decided to move to this Kelurahan as it is close to the husband’s workplace and it is free from river and tidal flooding. Family contacts have played a role in choosing this destination as they learned about it from one of the respondent’s siblings who had been living there for five years and who had also left a flooded house near the coast to move to Pedurungan. This sibling, however − whether on purpose or because they could not find a buyer − has not yet sold his house in the coastal area, but instead uses it for “investment purposes”, probably renting it to gain some additional income.

This history of internal movement in Semarang highlights the above mentioned balancing of the possible costs of staying versus those of moving. It is shown to be a negotiation process within the family influenced by external factors, such as flooding and land subsidence connected to the price of the house, costs of renovation and the distance to the work place, etc. This example elucidates how migration even for short-distances within Semarang, is influenced by financial considerations as well as by negotiations within the family. The trajectory, finally, connects

[60] Interview 52, migrant HH within SMG, 30.07.2015.

different sub-districts of Semarang and is part of the city’s suburbanisation processes, at the same time confirming the non-linearity of migration in a context of environmental change.

Goldbach (2017) concludes that people with good social networks (outside the coastal area) are more likely to move. This refers to the above mentioned example of coastal residents who decided to move to another place in Semarang where relatives were living.

5.4.3 In-migration to Semarang despite environmental problems

As stated above, Semarang is characterized by more in- than out-migration. This is not a recent phenomenon but has a long historical tradition. As the Semarang based Anthropologist Mujahirin states:

> *Semarang is a city with a port, so since the port existed very long time ago, in the colonial era, the migration also existed. Only the level and the number, as well as the motivation have changed. In the colonial era, most people migrated to Semarang to get a job in customs or in the port. Later Semarang turns into the governmental centre as well as trade centre in Central Java, so the attraction is increased, which means that the need to go to live in Semarang is also rising. (Interview Anthropologist)*

The general secretary of the Semarang Development Planning Agency (BAPPEDA) compares Semarang with sugar referring to an Indonesian proverb, “Ada gula, ada semut” (Where there is sugar, there are ants). Despite its environmental problems, especially in the coastal areas, Semarang continues to attract migrants from surrounding areas. He only mentions out-migration from Semarang in reference to well-educated people who get job opportunities in Jakarta or even abroad. However, they are fewer in number than those who move to Semarang. He furthermore points at the close link of this in-migration to the growth of the informal sector. From 2000 to 2010, this sector experienced a growth of 50percent. Referring to those in-migrants in the informal sector, the BAPPEDA general secretary states that according to an Indonesian or East Asian culture of hospitality people would feel guilty in rejecting in-migrants arriving in search of a better life in the city. Therefore, despite the legal regulation of the numbers of street vendors per Kelurahan, the local administration often gives more permits to stay and sell. (Interview BAPPEDA secretary) This fact might, however, also be interpreted as an indicator of an ineffective, if not corrupt, governmental administration.

Mujahirin describes the mechanisms of “chain migration” (Price, 1963) especially for those in-migrants with a low level of education who are working in the informal sector. He explains why they accept difficult living conditions in coastal areas:

> *At first they usually move to their friends’ (or relatives’) house, who have been living in Semarang earlier. Although sometimes the place is actually not really proper, they would live there for one to three months until they could manage to get a place for living by*

> *themselves, like renting a house or a room around Semarang Utara [North Semarang]. They usually live in not feasible neighbourhoods, such as in Bandarharjo. They face flooding and other environmental challenges everyday but they also have to feel comfortable there because they think that the condition is better than in their hometown. (Interview Anthropologist)*

Mujarihin further points to the community oriented understanding of life among Javanese people. Pleasures and happiness, in this context the advantages of living in the city, should be shared among family members, but the sufferings and the difficulties related to it should not be shared:

> *[...] if a person thinks that he is able to involve or to invite his relative from the village, he will do, but if he thinks he is still living miserably, he will hide it and will not invite his relative. He will try to survive and if he succeeds he will invite his relative to come. (Interview Anthropologist)*

Suyanto, another anthropologist at Diponogoro University in Semarang, whose research focuses on traders at Semarang’s markets, stresses the benefits for migrants and for Semarang, the receiving city, alike: “[...] among the traders in many of the traditional markets of Semarang, in-migrants outnumber the locals. They come for example from Solo, and even there are also people from Padang.”

He explains this in-migration by classic economic motives such as the possibility of earning more money in Semarang than in the migrants’ areas of origin, and thus the opportunity to help the family members left behind. On the other hand, all these in-migrants also contribute to Semarang’s economy, according to Suyanto. (Interview Anthropologist)

These in-migrants partly fill the spaces left by those who moved from the core and coastal area to the fringe area of Semarang. In-migration to Semarang is an essential aspect of urbanisation in Semarang, where the migrant workers represent informal workers as well as the workforce needed for the factories, the harbour and also the growing service sector.

An important group of the informal sector in Semarang include (street food) vendors, porters at the markets and construction workers. There are also professionals moving to Semarang because their employer transfers them, but they are the minority and they do not move to the coastal area but rather to the above mentioned new peripheral settlements. A third group of in-migrants are students moving to Semarang to study at one of the various universities.

In contrast to the out-migrants from Semarang who seem to only leave if they have a specific destination and work to do in mind, or if they get married and move to join their spouse, there are several in-migrants among the respondents who just came to Semarang looking for a job. Those in-migrants, however, especially those who later end up working in the informal sector, often come to Semarang without having a specific job opportunity. Rather, they rely on family contacts and

just hope to find work “in the big city”. Many then become as street food vendors, porters, *becak*[61] drivers etc. Others come with the specific hope of finding work in the textile industry, where demand is high and newcomers often find a job within a few days or weeks.

Coming to Semarang in search of work (and a better life), they are ready to accept the difficult living conditions of coastal areas because they want to be close to their workplace and housing is affordable. In-migrants thereby “fill in” the space left by house owners who decided to leave the coastal areas (because of flooding). Renting their houses as dormitories for workers brings additional income to the (migrated) households. Many in-migrants work either in the informal sector at the main market *Pasar Johar* or as workers in one of the factories near the harbour. Proximity to their work place therefore seems to be more important than environmental threats such as flooding and land subsidence.

In her work on the neighbouring rural area Morodemak, Gerstenerg confirms the importance of social structure in the communities affected by environmental changes. “Self-help among the population, neighbourhood networks, strong community ties and functioning local institutions are crucial for adaptation processes” (2016: 66), the author concludes, and she stresses the “back-up” function of community ties, in the context of a lack of social security systems provided by the government. To answer the question whether or not migration can be seen as important adaptation strategy, the case presented by Gerstenberg shows how Semarang City is linked to end embedded in the surrounding regions. Whereas, as mentioned above, in Semarang out-migration is not (yet) a common adaptation strategy among households, and the city is even attracting in-migrants, in Morodemak, “Long-term out-migration is one important livelihood strategy [...] especially among younger generations.” (ibid.) Gerstenberg clearly identifies the “diversification of income sources” (ibid.) in a context of declining revenues in the fishing sector due to environmental changes, as the main goal of these out-migrations.

The NRF survey indicates a rather sedentary population with 54 percent having always lived at their current place of residence and, out of those who had moved there, 41.2 percent have lived there for more than 30 years, another 35 percent for 10 to 29 years and only 24 percent for less than 10 years. Among the interviewed households, only 28 percent had received in-migrants within the last 20 years and only 30 percent of them had received assistance for their migration (mostly from a household member (61 percent)). The majority of those in-migrants moved due to family reasons (54 percent), followed by work (30 percent) and education (10 percent).

[61] *Becak* are bicycle taxis.

The situation in neighbouring rural Morodemak is quite different: 70 percent of the out-migrants received assistance (mostly from family members (88 percent) and in form of advice and information (26 percent) or financial support (13 percent), transport or housing). (Gerstenberg, 2016) These figures confirm the above mentioned complementary picture: whereas in Semarang the out-migration of a family member is not (yet) seen as a major adaptation strategy, in rural Morodemak it is.

A couple from neighbouring Demak explained why it had come and stayed in Semarang with the opportunities the city is offering them. Back in Demak their only work was farming and in Semarang they succeeded in establishing their small family business by collecting and selling all sorts of metal and other waste that could be recycled. In this way they earned more than they would have as farmers in Demak. (Interviews in-migrants)

Gerstenberg (2016) confirms that people gain opportunities when they move to the city when she cites one of her respondents who states that working in the city offers more opportunities to earn one’s living than fishing or farming in the rural areas. These latter activities are highly dependent on weather conditions and affected by extreme weather events and sea-level rise and erosion.

For this paper we chose the case of young women working in the garment industry in coastal Semarang to illustrate why Semarang is attractive for in-migrants.

Semarang hosts over ten garment factories and is known in the surrounding rural areas as a potential work place especially for young women. For example, it seems to be common for young women in Demak, east of Semarang, to migrate to Semarang after completing high school in order to work in one of the various textile industries. The young women often already know a sister or a friend who works in Semarang and the time span between leaving the parents’ place in Demak, moving to Semarang, applying for a job is usually very short. There are cases where young respondents found a job within only one week or even one day.
These contacts of friends or relatives who already live and work in Semarang’s garment industry provide important help for newcomers. They are often the ones who inform the potential migrants about vacancies in the factories and provide a place to sleep in the beginning often sharing their room in the dormitories with the new arrivals or tell about dormitories where newcomers find a place to stay.

Picture 4: This boat brings the young women every morning from Tambaklorok to their workplace at the other side of the water. (Picture: Ziegelmayer 2015)

Some of the young textile workers state that they found their current job through sewing courses they came to take in Tambaklorok, a part of Kelurahan Tanjung Mas. Some sewing teachers have agreements with the factories: they are provided with sewing machines for the courses and the young women get hired right after finishing the sewing course.

For most textile workers interviewed, one important motivation for leaving their parents’ house and moving to a dormitory in the regularly flooded areas of Semarang, was the desire to help their parents and family back home and their sense that it was their responsibility to do so. Many respondents clearly state that they came to work in the textile industry not only for their own well-being or out of their own wish to leave rural Demak for the big city Semarang. Although some were afraid of moving to Semarang, it was obvious to them that their aim was to work and help their parents.

> *Since we came from average economic level family, I and my older siblings wanted to get the job to help our parents. By working, we wish to get many experiences as well. (Interview in-migrants Tanjung Mas)*
>
> *I only have one dream. I want to see my parents live a happy life so I want to help them. (Interview in-migrant Tanjung Mas)*

Coming from a rural area, the city of Semarang represents (economic) opportunities for these young women and they decide to move despite their fear, motivated by a social responsibility for their families. In this context, the responsibility for parents as well as the economic opportunities carry more weight than the risks of flooding and land subsidence in the part of Semarang where they relocate. Additionally, those migrants coming to Semarang from neighbouring coastal regencies had already experienced flooding and did not mention environmental problems in Tanjung Mas as reasons why they considered moving.

Regarding the timing of these young women’s migrations, there are cases where women come to Semarang right after school, work there for some years and then go back to Demak for example to get married. Others interviewed have already been in Semarang for about five years and are married. Either the husband also works in Semarang or he works back in Demak. The geographical proximity of Semarang and Demak allows facilitates contact with parents and spouses and makes it easy to see them regularly. Asked about their future plans, none of the young women considered working in the garment industry for the rest of their lives. They either had plans to earn enough money to finance their university studies or to become self-employed, with their own sewing machine.

The garment workers earn about the minimum wage of 1,685,000 IDR/month[62] and some of them send most of this money home to their parents, between 500,000 and 1 million IDR. They normally work for 12 hours a day in the factories and can earn up to 2.5 million IDR[63] if they work additional hours.

As the young women often share a room in the dormitories (sometimes rented by house owners who left the coastal areas because of environmental problems to other parts of Semarang), they can save a lot of money. One room in a dormitory costs about 100,000 IDR[64]. Some respondents go home to visit their family every two weeks or at least once a month. Often they then take their remittances directly to their relatives, without losing money on transfer services.

Analysing migration in Semarang from a gender perspective, the textile workers are an example of mostly female migration. In addition to the economic opportunities which textile industry employment provides them, living on their own in Semarang also offers some freedom to those young women, for example meeting their boyfriend at the dormitory, something which would hardly be possible at their parents’ place.

[62] about 115€ (July 2016)
[63] about 172 € (July 2016).
[64] about 6.90€ (July 2016).

Men who move to Semarang work as fishermen or market porters. According to one respondent, however, men prefer to migrate to other islands, such as Kalimantan or Sumatra, or even to Malaysia, in order to work in the palm oil industry.

The example of migrant female textile workers, who move to Semarang despite environmental changes in the coastal areas where they live and work, illustrates clearly that environmental change does not forcibly lead to out-migration but that a complex interplay of various factors influences the actors’ decisions to stay or to move.

5.5 Conclusion

As our analysis shows a migration decision in a context of environmental change is never mono-causal. Environmental change, here consisting mainly of flooding and land subsidence, is simply one factor that influences decisions of (im)mobility in a specific context.

Despite its environmental problems, Semarang represents a destination for in-migrants, the majority of whom leave neighbouring regencies or other places in Central Java in search of work. The less educated are absorbed by the booming city that hosts a growing informal sector, as well as industries and an expanding service sector in need of workers. Even if those new-comers face (environmental) difficulties, leaving Semarang for another place is not a reliable option. Rather, they consider, as autochthones do, moving within Semarang to flood-free areas, depending on their (financial) capacities.

“In situ adaptation” is shown to be a major reaction to environmental changes. As long as people have the necessary financial means, or as long as the administration provides services such as elevating the roads, many people prefer to stay in the coastal areas that are close to their place of work and where they are embedded in their social networks. Financial resources and social networks play a major role in shaping people’s adaption capacities. The poorer the household or community is, the more they depend on governmental support, for example lifting up roads to adapt to environmental changes. There are, however, also those who might be qualified as “trapped” in the coastal areas because they simply do not have the (financial) means or contacts to move elsewhere. They therefore stay and are immobile due to a lack of alternatives.

Those who can afford to move and buy a house elsewhere leave the coastal areas but still stay in Semarang. This fact confirms the analysis that migration in a context of environmental changes is mostly over short-distances.

As this paper shows, environmental changes in coastal Semarang do not prevent people from moving there. On the contrary, the city remains attractive for in-migrants due to its various job opportunities, especially in the informal sector. These opportunities counterbalance the environmental problems, especially flooding, that in-migrants face in the coastal areas. As the BAPPEDA general secretary put it, “Semarang is like sugar.“ In other words, the city attracts migrants despite its environmental challenges.

This paper argues that decisions of moving or staying – mobility versus immobility – are always, also in the context of environmental changes, negotiated on individual, household and community levels. These negotiations are influenced by the specific context − in the case of Semarang, urbanisation processes.

6 Syntheses

The two case studies, Keta and Semarang, analysed in this dissertation illustrate in different ways how the environmental change migration nexus materialises in coastal regions. This synthesis answers the research questions presented in chapter 1, first concerning the Ghanaian case study, second concerning the Indonesian case, before situating the main results within current research on migration and environmental change and presenting an outlook for further research.

6.1 Ghanaian case study: Keta

Referring back to the initial research questions for this dissertation – "What are current migrant trajectories in the two study regions and how do they change due to environmental changes in the coastal areas?" – our research indicates that migrant trajectories in the Ghanaian case are regionally embedded, with the capital Accra being the most important destination and the vast majority of migration movements (86%) being within the country. (NRF survey 2015)

The analysis of the NRF household survey presented in Hillmann and Ziegelmayer (2016) characterises the Keta case study as an example of out-migration from a region affected by different environmental changes: sea-level rise, coastal erosion, and salinization. The migrant trajectories identified, however, are rarely directly linked to environmental changes but rather influenced by and embedded into a whole set of different factors. Nevertheless a policy brief by the International Organisation for Migration (IOM) from 2017 cites the Ghanaian government and states "The decline in the population of Keta [a town in the Volta region] is due mainly to the sea erosion which caused population movements out of the town and also affected commercial and other activities." (Paone and Richmond, 2017: 5) This IOM policy brief however, does not mention the migration history of Keta and in how far the historical background and migration experiences influenced who moved where to and who stayed in a context of well the documented decline of Keta (Akyeampong, 2001).

In his work *Between the Sea and the Lagoon – An Eco-social History of the Anlo of Southeastern Ghana c.1850 to Recent Times* (2001), the Ghanaian historian Emmanuel K. Akyeampong presents a detailed analysis of the microhistory of our study region. Answering our research question on the perception of environmental change, Akyeampong's work clearly shows that neither sea erosion nor migration is new to the region but have been well-known phenomena to Keta's population and to the government since the beginning of the twentieth century.

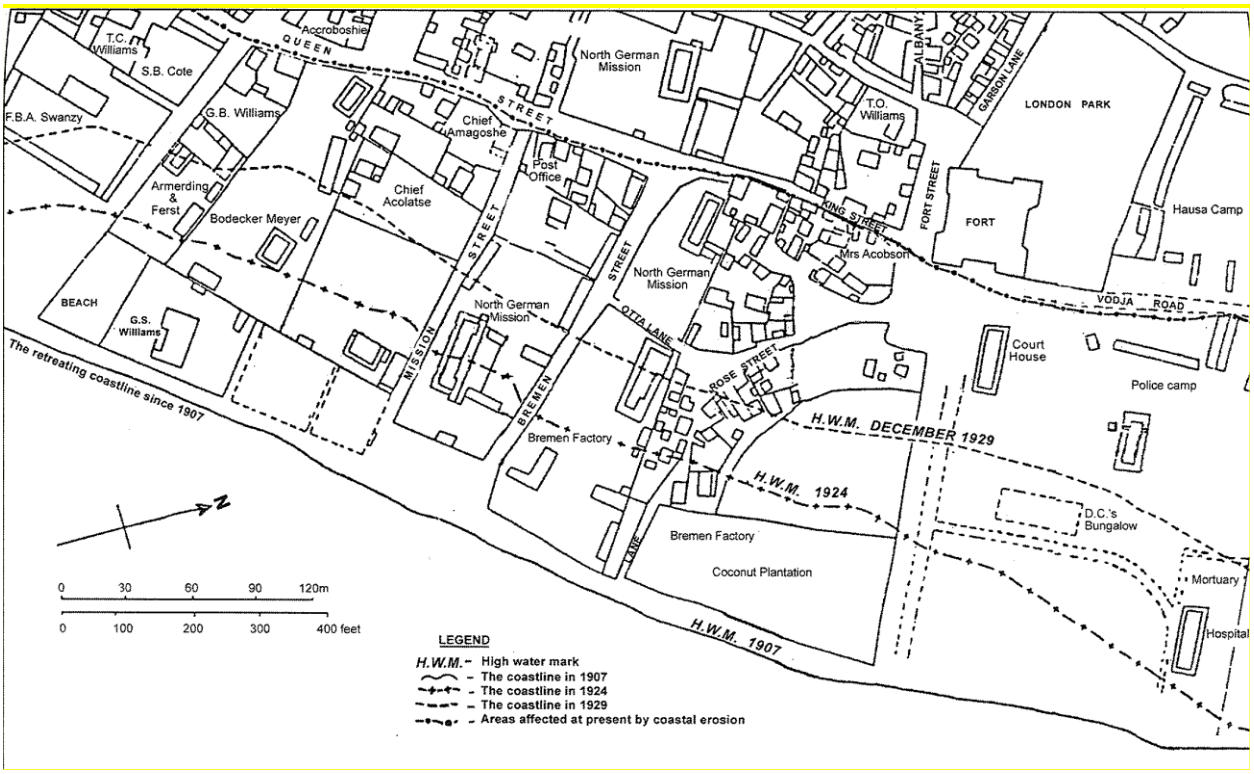

Figure 15: High-water mark in Keta Town, 1907-1929 (Akyeampong, 2001: 105)

The respondents' memories tell of the great distance from the town to the shore in years past. A frequent narrative told by parents and grandparents is that the sea was so far away from the settlements that people had to carry food when they went there in order not to get hungry during the journey:

> *At first I learnt the sea was far from us; our great grandmothers say it's not an easy walk you would take before getting to the sea shore. They said they went there to sell when the ship docks. There was a harbour there before […] our great grandmothers say when they were going there they carry foodstuffs to go and sell and whites have been coming to the area. That time, too there is work there to do. They say if they are coming back they are always tired. There was sand all over. There are coconut trees planted all over to the shore and today the sea is closer to them (Interview migrants Accra).*
>
> *[O]ur grandma [name] told us, those days when they were going to the beach for fish they have to carry food. It's about two-and-a-half miles, three miles to the beach. So the sea was just taking the land, taking the land, it got to the lagoon. I would say the sea and the lagoon they have met (Interview migrant Accra).*

Another migrant remembers the above-mentioned vibrant past of Keta and tells about his family who used to trade between Keta and Lomé, and even as far as Kara in northern Togo. This trade and regional mobility very much depended on the coastal road linking Keta with neighbouring coastal communities, as well as linking the Ghanaian capital Accra with Lomé, the Togolese capital. But this road has been destroyed several times by the sea, thereby cutting off Keta from

all major trading partners. Only now is the road being rebuilt in the framework of the Sea Defence Project.

> *Oh, those roads about 3 or 4 of them are in the sea. So the trade between Lomé and Togo, very vibrant … Lomé and Keta, very vibrant … So Keta also, I remember my grandmother, we used to trade all the way to Lama-Kara; Lama-Kara is at the northern part of Togo. (Interview migrant Accra)*

Until the late 1960s Keta was the regional capital of the Volta region, and during that time it was a major regional market attracting traders and migrants from far and wide. Today, Keta resembles a "ghost town", with many abandoned warehouses and a languid market that is rarely active, even on market days. A market woman from Keta describes the situation drastically: "I keep saying that if nothing is done here for us about the Keta market, the place will soon become a football pitch that children will use as their playing field" (Focus group market women, Keta).

Agriculture and fishing are still the main livelihoods in Keta and the municipality failed to compensate for the loss of certain functions as a former regional capital and major market. The Keta case is an example of national policy impacting local development as it caused a reduction in the availability of jobs and subsequently initiated migrant trajectories.

The respondent furthermore recounts that his family changed their fishing activities due to coastal erosion. They used to fish predominantly in the sea, but with the erosion getting increasingly severe, they switched to lagoon fishing:

> *Fishing was very prominent, primarily, we were not fishers of the lagoon, we were more of the sea, the sea, Vodza [part of Keta Municipality] … our focus was more on the sea. I know the earlier days, yeah it's the sea but when we were being pushed to the lagoon, and the sea started coming inland, definitely the bed of the sea was becoming shallow and shallower so definitely some fishes that should have come are not more coming (Interview migrant Accra).*

This quote shows that environmental change does not forcibly lead to out-migration but can lead to in situ adaptation of economic activities like fishing but also agriculture.

Referring to the initial research questions, we conclude that migration is one of the adaptation strategies to environmental risks in the Ghanaian case, but the migrant trajectories in the region are not influenced by environmental changes only. They are embedded into a complex set of different factors.

Besides environmental factors influencing migration and mobility patterns in the region, socio-cultural and educational infrastructure, as well as the economic and political decline of Keta as a former major trading point, have likewise played an important role. From a gender perspective, the NRF survey shows that 58 % of the interviewed households are male and 42 % female

headed. This comparatively high percentage of female headed households in an otherwise patriarchally organized society could be an indicator for out-migration of male household heads in order to diversify the household income.[65] Furthermore, Keta is an illustrative example of how the long-term migration experiences of individuals, families, and communities create positive images of migration and the perception of migration as a synonym for progress, not only for the individual migrant but for the whole family and community.[66]

One respondent clearly states:

> *R1: No… you realize in this world, for instance, as I am now, if my child becomes the same [a fisherman], then that means the household is not progressing, it is necessary my child gets higher than me and you would notice that the household is progressing.*
>
> *UZ: So you wish for them to go further than you and that means they have to leave Keta?*
>
> *R1: Yes (Interview migrant household).*

This longstanding migration experience in Keta is embedded in a socio-cultural context of the migration saga of the Anlo-Ewe, the major ethnic group in the region, who continues to celebrate the migration of their ancestors from Egypt through the Sahel region and Notsie in Togo up to "Anlo Land" in today's southern Volta Region (Kumassah, 2009). The migrant trajectories presented in Ziegelmayer, Spaan (2018) indicate that Keta's population has been used to short-distance travelling, internal as well as international migration for a long time.

Coming back to the research questions, as to who are the actors influencing migrant trajectories, we conclude that in this setting, the above-mentioned long-term migration history of the region allows new migrants to rely on former migrants' contacts at the destinations which facilitate the journey as well as integration. Strong international ties and skilled migration are frequent in the case of Keta. In linking migration to environmental change in Keta, short-distance migration – often within the municipality – is one adaptation strategy that depends on existing household resources and contacts. As stated in (Ziegelmayer and Spaan, 2018) – chapter 4 – the way a specific household reacts to environmental changes, especially the destruction of one's house by the sea, depends on the social and financial means of the respective household. There are families who already own another house further away from the sea where they can move to, while others move in with their relatives nearby, either permanently or until their own house is no longer flooded. Those households with sufficient financial means buy land elsewhere – often within the

[65] For a more detailed description of Keta's decline in the 1960s, see Akyeampong (2001: 182ff).
[66] There is a vast body of literature on migration as synonym of progress, giving social prestige to the migrant and his/her family; see Mbodji (2009); Gaibazzi (2020).

municipality – in order to build a new house.[67] Due to the long history of coastal erosion in Keta, this movement within the municipality does not only happen once in a household's history. Several respondents stated that they are currently living in their fourth or fifth house, with their former houses having been destroyed by the sea. Despite this long-term experience of short-distance movement due to environmental change in our case study, research in other regions reminds us that these various displacements over the years due to slow-onset environmental change like sea erosion are far from being an indicator for a successful adaptation. In his work on environmental degradation in the Bengal Delta, Harms alerts that this is "resulting in the disappearance of homes and plots, livelihoods and attachments to place. Such processes, which often lead to more permanent forms of loss for those affected than extreme climate-related weather events, are barely less cruel in their consequences." (Harms, 2020: 155)

In Keta, environmental changes and hazards are part of everyday life but represent only one factor influencing migrant trajectories. According to Castles (2002), the question of whether environmental change leads to migration depends very much on the political, economic, socio-cultural, and development context. In Keta, national policy has failed in providing adaption measures either early enough and in an effective way, and environmental change has therefore worsened the region's continuous political and economic decline. Though the current sea defence (built in 2001) protects an area stretching from Dzita to Atorkor and from Keta to Kedzi, it has caused more accretion west of the sea defence and more erosion east towards the border with Togo. (Appeaning Addo et al., 2011)

In our paper *Migrant trajectories within the context of demographic, socio-economic and environmental change. Evidence from coastal Ghana* (Ziegelmayer and Spaan, 2018) we combine the life course histories of interviewed households from Keta with the migrant trajectories of family members. We use the term "linked lives" (Kou et al., 2015), referring to Elder 1975, 1994) in order to illustrate the interconnectedness of one life and migrant trajectory with others. As Figure 16 demonstrates, migrant trajectories connect different contexts (household, local, regional, national, and international) and factors influencing the migrant trajectory (economic, educational, socio-cultural, political), and they coincide at "specific biographical as well as spatial points in the trajectory" (Ziegelmayer and Spaan 2018: 52).

[67] The collected data indicates that migration related to environmental change rather is short-distanced. There might, however, be a lack in information concerning those households that had already migrated (maybe also further away) some time before this research was conducted and which could not be traced back.

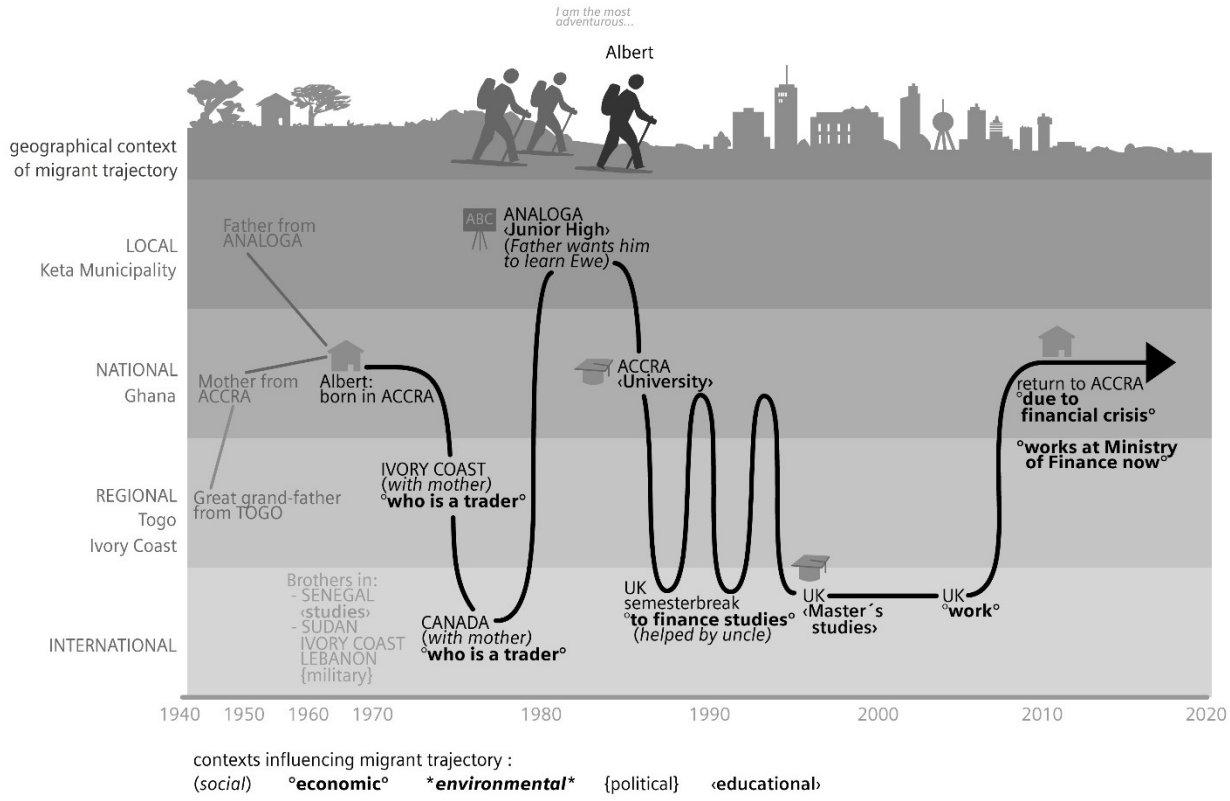

Figure 16: Alberts migrant trajectory (Concept: Ziegelmayer and Spaan, Design: Piller)

Despite the positive perception of migration in Keta, as well as the different factors influencing migration, there are people who for different reasons do not leave the area. This immobility could be of a demographic nature – the persons concerned are too old to migrate – or related to job opportunities in Keta – for example, if someone has established his or her business in the region. It may also be cultural – with people being attached to their land and their property due to resettlement, policies within the municipality that provide families that have lost their house because of coastal erosion, with a new residence in Keta. Finally yet importantly, some people do not have the necessary financial means and/or social contacts to move, the so called “trapped populations”.

Environmental changes in this case study do not represent the one and only reason “pushing” people to leave their home but are rather indirectly linked to migration by, for example, reinforcing economic and political declension. The way a specific household reacts to environmental changes in terms of migration appears to be a result of the interrelations of the different contexts presented in Figure 16, with the migrant trajectories of different family members being the “glue” linking those different contexts.

6.2 Indonesian case study: Semarang

At first glance the Indonesian case study is quite contrary to the Ghanaian case: a rapidly growing urban centre with over 1.5 million inhabitants and a booming industrial and service sector attracting migrants from neighbouring regencies. This second case study also confirms the assumption of migration and environmental change as not being linked in a mono-causal way but rather environmental change being neither more nor less than one factor in a specific context influencing decisions of (im)mobility.

In the Indonesian case, migrant trajectories show out- as well as in-migration; the latter is even more significant according to official migration data: even though the city faces various environmental challenges, Semarang City shows the highest positive net-migration rate in Central Java (calculation based on: 21)[68], whereas the rest of the province is experiencing high out-migration. The NRF survey hints at a sedentary population with 54% of households interviewed having always lived in the same place, and among those who moved to their current home, 28% had previously lived elsewhere in Semarang City. Equally, in-migrants moving to Semarang are for the most part short-distance migrants, with 24% coming from another sub-district of Semarang City, 36% from the same province, 17% from neighbouring regencies, 11% from other islands, and 8% from other provinces in Central Java.

Out-migration is also concentrated to the nearby geographical region with 32% of the migrants having moved within Semarang and 27% within Central Java, half of them to neighbouring regencies.

Both case studies strengthen the initial hypothesis formulated for this dissertation that environmental change is not linked to out-migration in a mono-causal way. The Ghanaian case study illustrates how different factors including environmental change influence migrant trajectories, and that the long-standing migration decisions, as well as the positive perception of migration, strongly influence the context within which migration occurs. The Indonesian case study goes even further, with its in-migrants moving to affected coastal areas in search of work opportunities in the big city whilst those who can afford to move away from the coastal areas for the large majority move not far away but to other parts of town.

[68] The other regencies/municipalities with positive net migration rate (no. of migrants per year per 1,000 inhabitants) in Central Java are Sukoharjo (15.19 recent migration), Salatiga (11.59 recent migration) and Karanganyar (5.45 recent migration).

Semarang's population does not have a long-standing tradition of migration, and international migration is largely an exception. Migration is not perceived by the population as a success model but rather as a threat, with 49% of the respondents stating "you should never leave your place of origin", and about half of the respondents not seeing the benefits for the household if one of its members migrates. Migration in this context, does not figure as a major strategy to improve the situation or the prestige of the whole household. However, 60% stated that migration would be beneficial for the community as a whole.

Populations living in the coastal areas of Semarang are affected by and extremely vulnerable to environmental changes like flooding, salinization and land subsidence and rely on their income from the informal sector or their work in the neighbouring industrial zone and the port of Semarang.

Though affected by various environmental changes, Semarang is an example of a city that nevertheless attracts in-migrants. The majority of these migrants come from neighbouring regencies or other places in Central Java (NRF survey 2014).

This case study serves as an illustrative example that environmental changes in coastal areas do not forcibly lead to out-migration but – depending on the context – that other factors may outweigh the difficulties caused by erosion, land subsidence, and flooding and that people nonetheless decide to migrate into affected zones. In Semarang a booming textile industry, the harbour, and the market mainly provide job opportunities for migrants from neighbouring regencies. Referring to the Indonesian proverb "*Ada gula, ada semut*" ("Where there is sugar, there are aunts"), the BAPPEDA[69] general-secretary stated: "Semarang is like sugar", attracting migrants who come despite flooding, land subsidence, and erosion in the coastal areas.

Studies on neighbouring regencies however hint at the fact that environmental changes like flooding, salinization and decline in fish catch due to hazards in the rural areas lead to migration of coastal populations to the industrial zone of Semarang in search for work. (Gerstenberg; Handayani and Kumalasari, 2015)

There is a growing body of literature on migration to urban areas in times of climate and environmental change warning that migrants are exposed to various environmental but also health risks in those areas. McMichael refers to Bangladesh where

> *"moving to cities has become a common coping strategy in the face of flooding. But although people who move to a peri-urban area may take advantage of new livelihood and*

[69] Regional Development Planning Agency.

> *income opportunities, they may also be exposed to health risks via their new living and working conditions. People are as likely to migrate to places of environmental and climatic vulnerability as away from them, and they may face associated health risks in new sites of residence." (McMichael, 2020: 82)*

Calling for urban climate justice including for migrants in cities, Anwar and Sur with their work on South Asian cities show that

> *« Despite providing avenues of employment for large numbers of the rural and urban poor, South Asia's construction boom is not ameliorating the conditions in which most are forced to live and earn their livelihoods. In fact, for the migrant poor, who lack political voice in cities, real estate development disrupts social networks while heightening exposure to emerging climate risks and financial precariousness, thereby generating conditions of injustice and exclusion." (Anwar and Sur, 2020: 67–68)* [70]

In Semarang "in-situ adaptation" turned out to be an important reaction to environmental changes: people invest considerable amounts of money in order to be able to stay in their coastal homes. By raising the floor or the whole house with private means and relying on the local government to lift up roads and public places, affected populations work hard to be able to stay in the coastal areas, often due to geographic proximity to their workplace.

In Semarang the historical background of the city shows it to have been an important trading hub since the colonial era, with a port that was once the largest on the island of Java. . In contrast to the Ghanaian case study, Semarang remains an important trading centre with its port connecting the city both nationally and internationally. A growing industrial and service sector attracts migrant workers from neighbouring regencies despite the aforementioned environmental challenges. Whereas Keta Municipality has experienced economic and political decline since the 1960s, Semarang is situated in the province of Central Java with a constantly rising urbanisation rate, from 40.4% in 2000 to 56.2% in 2010, with further projections of 73.8% by 2025 (Indonesian Statistical Bureau, 2010, cited in Hillmann and Spaan 2017: 41). Semarang's population is growing faster than in the surrounding areas, with a 1.4% per anum increase partly due to in-migration from the surrounding districts. (Mulyana et al., 2013b)

The environmental challenges in Semarang's coastal areas are not only due to climate change related sea-level rise but are also a consequence of the establishment of residential settlements and industrial constructions on wet lands and alluvial soil. During the last 300 years, Semarang's coastline has moved more than 1.5km (Helmi, M. et al., 2014) "into the sea", and today's coastal parts of town are built in areas that were formerly under water. Almost 840,000 people live in Semarang's low elevation coastal zone (LECZ, less than 10m above sea level) (Mulyana et al.,

[70] Referring to Chu, E., and Michael, K. (2018), «Recognition in Urban Climate Justice: Marginality and Exclusion of Migrants in Indian Cities», *Environment and Urbanization* 31(1), 139–56.

2013a). The topography of Semarang, with a steep mountain area in the south and a LECZ in the north, worsens the risk of flash floods from the rivers and tidal floods at the coast (Marfai and King, 2008). Since the 1990s this situation has been exacerbated by the cutting down of mangrove forests for fish farming, as these forests used to protect the coastline from erosion.

Urbanisation in today's coastal Semarang induces increasing groundwater extraction in the more densely populated areas of the city and a growing concentration of construction sites in those zones. These developments, combined with the "natural consolidation of young alluvium soil" (Abidin et al., 2013), worsened the land subsidence situation to "rates of up to about 19 cm/year […] during the period of 1999 up to 2011" (ibid.).

Despite those various environmental challenges, Semarang City is the only city in the province of Central Java – though traditionally a region of out-migration - with a positive net-migration rate according to official census data. Our NRF survey however indicates a negative net-migration rate for Semerang. This contradiction could be explained by a high level of undocumented migration and/or the rather neat definition of migration as movement from at least one sub-district (*Kecamatan*) to another in our survey.

The Indonesian case study, as presented in Ziegelmayer (2018), shows that Semarang's population is not particularly mobile: "54% having always lived at their current place and out of those who had moved there, 41.2% having lived there for more than 30 years, another 35% for 10 to 29 years and only 24% for less than 10 years" (ibid.: 21). Furthermore, mobility according to the NRF survey seems to happen either within Semarang City (32% of the migrants from the households interviewed) or on the island of Java (47%, the majority of them within Central Java). In terms of the perception of migration, Semarang gives a very different picture from the Ghanaian case study: instead of seeing migration as positive for the individual and the household, the respondents do not see the migration of a household member or the household as a whole as a common strategy for improving the situation of those living in Semarang.

Qualitative interviews show three categories at the nexus between environmental change and migration for Semarang: in-situ adaptation, internal migration in Semarang, and in-migration to Semarang despite environmental changes.

The respondents who decide to stay in the coastal areas explain their decision in three ways: the financial costs of moving and the money already invested in their current house; the "strategic location" of the coastal areas being close to the harbour, the market, and the airport; and finally, for socio-cultural reasons.

The capacity to actually adapt “in situ” depends on the financial resources of the household in question. Those who live in rented houses prefer to leave if they have enough resources to avoid higher rents once the landlord invests in raising the house.

McMichael argues that not all immobile populations in a context of environmental changes are “trapped” and stay due to lack of means to move. The author at the same time calls for a deeper understanding of “potential threats to health and wellbeing, including injury and fatalities related to severe weather events, food and water insecurity, changing infectious disease patterns and mental health consequences.” (McMichael, 2020: 90) for those who decide to stay.

In this debate on how far not only moving but also staying is due to a voluntary decision and not necessarily to be seen as forced, it is important to note that in the Semarang case, those who argue in favour of their “strategic location” are mostly respondents from the economically better-off *kelurahan* Panggung Lor. They can afford to raise their house and therefore do not experience the more disruptive consequences of flooding.

Answering our research question on the perception of ongoing environmental changes among Semarang’s coastal population we conclude that perceptions differ, depending on the frequency of the flooding and the financial means enabling a household to protect their home by either raising the whole house or merely the floor.

The second category concerning the interrelation between environmental change and migration in Semarang is internal migration within the city. As indicated above, research shows that migration in the context of environmental change is often internal and short-distance. This is also true for Semarang, where the respondents deciding to leave the coastal areas do not leave the city but instead move to another part of town, especially the southern parts away from the coast and free from flooding. Just as those who decide to stay, the movers also balance any financial loss against the benefits of moving. Semarang’s booming urbanisation, including the building of new settlements in the southern parts of town, comes with rising house prices in those areas.

Anwar and Sur take the example of Bangladesh’s capital Dhaka and warn against a future “climate apartheid”, a term first introduced by UN Special Rapporteur on extreme poverty and human rights, Philip Alston in 2019 in his report submitted to the U.N. Human Rights Council (UNHCR, 2019). Anwar and Sur describe Dhaka as a setting of exacerbating inequalities within the city which might be a future scenario for our study area Semarang as well:

> *The elite navigate the city by avoiding slums and informal settlements, which is where: the vast majority of Dhaka's poor and marginalised groups reside, infrastructure services are generally lacking and safe drinking water remains inaccessible. Inequality and lack of*

> *affordable housing force the urban poor to live in informal spaces that are likely to be more vulnerable to climate change hazards such as flash floods, thus increasing their exposure to flooding. With homes destroyed and livelihoods compromised due to flooding, marginalised communities have less ability to cope with, and recover from, the damage caused by such displacement. (Anwar and Sur, 2020: 69)*

Someone who wants to sell their coastal house in Semarang, has to calculate if they will be able to buy a new house elsewhere. This calculation proves especially difficult for poor populations. Some homeowners at the coast decide not to sell their house when they leave but instead rent it to in-migrants and thereby gaining an additional income.

The case study shows that even for short distance migration within Semarang the decision-making process is not mono-causal. Rather, it entails a negotiation amongst individuals within a household who consider economic, environmental, and social factors. Furthermore, the spatial trajectory is not forcibly linear but embedded in the city's urbanisation processes, and may integrate several places where a household moves to one after the other.

As initially stated, the case of Semarang clearly contradicts the assumption that environmental changes directly lead to out-migration. On the contrary, Semarang's booming industrial and informal sector makes the city an attractive destination for in-migrants, especially from the surrounding regencies of Demak and Kendal. This in-migration is part of the city's urbanisation processes, might partly be influenced by environmental change in surrounding regencies, and in-migrants generally constitute the (informal) workers needed in construction, at the harbour, in textile factories, and the growing service sector. Social contacts – that is, relatives or friends already living in Semarang – play a crucial role for in-migrants. As shown by the example of young women from neighbouring Demak working in the garment industry at Semarang's industrial area near the harbour, these social contacts provide accommodation and help in finding a job for newcomers. The female garment workers interviewed for this study were used to environmental problems in their respective hometown, and they came to Semarang to earn money to support their parents and family back home. Therefore, they were prepared to live in the regularly flooded coastal area. Coming from a neighbouring regency allowed them to regularly keep in contact with and visit their parents. On the other hand, as young women living on their own in dormitories in Semarang gave them a degree of freedom that they had hitherto not experienced living with their families. However, just as in the Ghanaian case study, Semarang also indicates the presence of "trapped populations"[71] who simply do not have the financial means nor social contacts to move

[71] For recent work on « trapped populations » and « immobility in times of climate and environmental change see Zickgraf (2018).

and are therefore forced to stay in the coastal areas, often without being able to protect their house from flooding.

To summarise, the Semarang case study indicates that in a context of environmental change the migration decision-making processes are always a result of negotiations on an individual, household, or community level embedded in and part of urbanisation processes considerably influencing the context within which those negotiations take place.

Anwar and Sur stress the importance of basic rights for migrants in particular and urban populations in general who are more and more threatened by climate and environmental change in contexts “denying them their right to the city and undermining their claims to basic and essential services such as access to water, housing and clean air.” (Anwar and Sur, 2020: 79) Calling for climate justice, the authors stress the importance of a gendered perspective on climate change and migration: “Addressing climate change calls for highlighting the experiences of the most marginalised, including poor women, by including the voices of feminist political ecologists and policymakers.” (ibid.)

7 Conclusion and outlook

Our two case studies underline in different ways the importance of the historical, social, cultural, and economic contexts of a specific region in order to understand how populations perceive and react to environmental changes and whether migration can be a successful adaptation strategy or rather exacerbates the vulnerabilities of the populations concerned. Using the concept of “migrant trajectories” that defines migration as a non-linear process and “one form of social and spatial organization in regional settings that are under stress, i.e. environmental stress” (Hillmann and Ziegelmayer, 2016) integrating all periods of migration from departure and transit to reorientation and arrival, allowed us to integrate these different dimensions into the analysis. With power relations (Carr, 2005) being an integral part of migrant trajectories and influencing the way migrants interpret their environment and the world around them, the concept integrates the migration history and experience of individuals, households, and communities, as well as myths and narratives around migration. This broad scope of analysis in a regional perspective showed to be fruitful for our two quite different settings of the case studies, as it allowed to integrate context specific elements and called for a mobile research design.

Both case studies strengthen the understanding of the migration-environmental change nexus as a complex interrelation of various factors. Reality is not as simple as the minimalist approach (Suhrke, 1994) supposes. Environmental changes in both study areas influenced economic

activities of the populations concerned. But whether people migrate at all and what kind of migrant trajectories evolved depends on various factors like the collective and individual migration experiences, financial means and social contacts, attachment to place etc. Despite their various differences, populations in both study areas prefer short-distance migration within the same municipality in cases of migration induced mainly by environmental change.

Adamo (2013) underlines that natural disasters are not forcibly followed by massive out-migration but that persons affected move temporarily. The author states that the decision to migrate is influenced by several aspects, such as the degree to which one's house and local infrastructure has been affected by natural disasters. But more substantially, most people migrate if their workplace or other income opportunities are affected and if the area has a history of out-migration. McMichael equally argues that "It is probable that climate related migration will follow existing migration pathways, particularly internal migration within the borders of a country." (McMichael, 2020: 88)

These analyses strengthen the importance of migration experiences and the relevance of the history of the regions concerned, integral part of "migrant trajectories". This „interplay of juridical regulations, the political handling of migration, migration traditions and cultures of migration in different parts of the world" (Hillmann 2016: 160, translated by the authors in Hillmann and Ziegelmayer, 2016) is well captured in the concept of "migration regimes"[72]. According to Hillmann (2016) this interaction between regulations by law, political actions in favour or against migration, migration traditions and „cultures of migration" constitute the different "migration regimes" worldwide. These migration regimes are not about mobility and free movement alone, but, for a great part, about control and hindering the movement of people. Schapendonk refers to the mechanisms which hinder migrants to move as "immobility regimes" (Schapendonk, 2013) and stresses that "people have different accesses and possibilities to connect to global flows and interactions" (Massey 1994, cited in: Schapendonk, 2013: 11).

As for the presented case studies, the Ghanaian region was used to migration – internal, regional, and international – and this migration continues to happen, but not exclusively as a result of environmental changes. In Indonesia, however, the populations of coastal Semarang only have very limited migration experiences and therefore do not (yet) see migration as a major adaptation strategy; they instead invent various approaches to be able to stay where they are, or at least to remain in the same city. Migrant trajectories in Semarang were rather oriented towards Semarang

[72] For further literature on migration and mobility regimes, please see Salazar and Schiller (2014).

since the colonial period. The city has never been a source of large-scale out-migration. This limited migration experience of Semarang's population combined with the fact that in-migrants accept living with environmental problems in Semarang – referring to the above-mentioned way migrants interpret their environment - explains why Semarang's population is rather immobile despite various environmental challenges.

As stated in the beginning of this dissertation there is a growing body of literature stressing the complex interrelation of environmental change and migration whereby the link is not mono-causal but rather environmental change is but one factor in a complex web of contexts. In her recent work on slow-onset environmental change in the Sahel region, the sociologist van der Land shows the importance of individual aspirations and social aspects like education – an important factor in our Ghanaian case study - and the attractiveness of urban lifestyles – one reason for in-migration to urban Semarang despite environmental changes. Based on quantitative and qualitative data from Mali and Senegal, van der Land concludes that slow-onset environmental changes may influence migration decisions less than presumed by alarmist discourses presented in the media. (van der Land, 2019)

An IOM policy brief on migration, environmental and climate change in Ghana from 2017 states "While many migrants perceive their decision to migrate as an economic and food security choice, the initial drivers of migration are climate change effects." (Paone and Richmond, 2017: 2)

These - on the first sight contradicting – statements illustrate the complexity of the nexus between environmental change and migration described in the introduction of this dissertation as well as the different perspectives within academia versus those coming from international non-governmental organizations, which follow also a political agenda. On the one hand a vast body of scientific literature nowadays stresses the "maximalist" perspective with environmental change as one of many factors influencing migration. On the other hand NGOs whose mandate is to protect migrants and who are often also in need of fundraising for their work, but also (international) media attention, tend to defend a (sometimes simplified) perspective that focuses environmental change as "initial driver" or "root cause" of migration.

However, an oversimplified analysis of the environmental change – migration nexus can indeed contribute to a more restrictive discourse on migration and become "a significant part of a broader securitization discourse that depicts climate change as an increasing threat to national security." (Klepp and Herbeck, 2016: 60–61). A recent publication by Ahmad and the Heinrich Böll Foundation (2020) warns that "attempts to link climate change with conflict can be motivated by

calls for securitisation of borders rather than protective rights for migrants." (Ahmad and Maas-Albert, 2020: 11)

These different positions on the environmental change – migration nexus are especially important when it comes to recent debates about climate and mobility justice.

Whilst both concepts are not part of this cumulative dissertation, they represent important recent developments in the academic and political debate around the environmental change – migration nexus and are mentioned here as an outlook for further research.

Framed around the central idea of global justice and human rights, "The concept of mobility justice underlines that access to mobility is experienced unequally, along intersectional categories such as gender, race, religion, age or socio-economic status." (Fröhlich, 2020: 138–139; Sheller, 2018) The concept of mobility justice reminds us of the above mentioned "immobility regime" (Schapendonk, 2013). Sheller develops the concept in her monography *Mobility justice. The politics of movement in the age of extremes* and calls for a "holistic theory of mobility justice" (Sheller, 2018: 315) integrating "transport justice, spatial justice, environmental justice, or climate justice" (ibid.)[73]

The concept of climate justice brought forward by climate activists especially from the Global South and more and more academics is based on the fact that despite climate change being mainly caused by the industrialized states, the Global South is already suffering and will suffer most from its consequences. (Fröhlich, 2020; Klepp and Herbeck, 2016)

Thus highlighting that in the debate around environmental and climate change, mobility and migration, resources and opportunities as well as risks are far from being equally distributed Fröhlich argues "Not everyone can move, even when at extreme risk, and not every state can adapt to climate change in an effective and targeted way." (Fröhlich, 2020: 148)

Expanding on this reflection, Baldwin et al. in their introduction to the issue *Anthropocene Mobilities* of the journal *Mobilities* refer to Sheller's work and call "to re-characterise those displaced by 'climate change' not as 'climate refugees', but as displacees of a globalised network of intersecting mobility regimes fuelled by fossil fuel extraction." (Baldwin et al., 2019: 291)

[73] Sheller's work conceptualizes « mobility justice » as ranging from transport and infrastructural justice, over racial and migrant justice to environmental and climate justice. She presents a list of "Principles of Mobility Justice" (Sheller, 2018: 391ff) which among others state "Those displaced by climate change shall have right to resettlement in other countries, and especially in those countries that contributed most to climate change" (ibid. 393) thereby linking questions of the right to move with debates around climate justice and global responsibility for climate change.

Whilst this perspective exceeds the scope of this dissertation it holds an important conclusion to the long lasting debate on the usefulness of the term “climate refugee” and alike, as it tackles two aspects: First, it dismantles the above mentioned risk of misuse of the debate on so called “climate refugees” for further securitization of national borders. Secondly it clearly names the real “root cause” of the current climate crises and its consequences as global extractive capitalism that itself is historically rooted in colonialism.

The above-mentioned issue *Anthropocene Mobilities* adds important points of discussion on these topics with Turhan and Armiero arguing for “a cross-pollination of mobility justice and climate justice as urban citizenship.” (Turhan and Armiero, 2019: 363) In response to an ongoing process of securitization and closing of borders, the authors “suggest that cities can respond to the burning mobility challenges of our times with a just, grounded and egalitarian urban citizenship framed as mobile commons.” (ibid.: 363) Several contributions of the issue also stress the historical links and continuities between the effects of colonialism and today’s so called “climate migration”. (Suliman et al., 2019; Whyte et al., 2019)

As Baldwin et al put it: “But even more powerfully, [mobility justice] calls attention to the Eurocentrism of ‘climate change and migration’ discourse, and thereby repositions Indigenous knowledges and experiences of mobility as of primary importance for attaining justice in the context of climate change.” (Baldwin et al., 2019: 291–292)

The United Nations Global Compact for Safe, Orderly and Regular Migration adopted in December 2018[74] by the majority of the UN member states is an important, although not legally binding, international policy document in this context. The compact stresses the importance of respecting human rights of migrants in times of climate change – a core element of the above mentioned debate around climate and mobility justice – and “frames mobility in terms that contrast sharply with the pessimism of climate security discourse, challenging its dominance within the policy mainstream.” (McMichael, 2020: 81–82)

To conclude, further research that combines the concept of migrant trajectories with its opportunities to integrate a wide range of social, historical, political and environmental aspects of the migration-environmental change nexus with the above-mentioned approaches of “climate and mobility justice” seems promising. This combination would allow to integrate questions of social justice into the trajectories concept and to strengthen questioning of power relations while at the same strengthening perspectives and (migration) experiences and perceptions of populations

[74] UNHCR (2018).

concerned in the academic and political debate on migration and environmental change. Combining these approaches calls even more for participative and mobile research designs as indicated in the critical remarks on methodology mentioned above.

In times where climate change, migration and mobility are lived realities for more and more people on this planet, questions of human rights and justice - in terms of climate and mobility justice - are crucial for further research as well as efficient and successful policy making. Research and policy making alike in this context should aim at fighting climate change and environmental degradation whilst protecting and not fighting migrants. In order to do so inclusive and participatory research and policy making is key to understand specific local and regional social, cultural and historical contexts and to develop appropriate adaptation and mitigation measures empowering and protecting those who are affected most.

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9 Annexes

9.1 List of interviews

Interviews field research Ghana 2014			
No. Interview	**Date**	**Location**	**Type of respondent**
1	7/29/2014	Keta	Key Informant
2	8/10/2014	Keta Municipal Assembly	Key Informant
3	8/14/2014	Kodjoviakope-Lomé (Togo)	MigrantIn
4	8/14/2014	Kodjoviakope-Lomé (Togo)	MigrantIn
5	8/14/2014	Ahanoukope-Lomé (Togo), marché au poissons	MigrantIn
6	8/16/2014	Anlokondzi-Kpalimé (Togo)	MigrantIn
7	8/22/2014	Kedzi	MigrantIn
8	8/22/2014	Keta	MigrantIn
9	8/25/2014	Adenta-Accra	MigrantIn
10	8/25/2014	Adenta-Accra	MigrantIn
11	8/25/2014	Adenta-Accra	MigrantIn
12	8/25/2014	Adenta-Accra	MigrantIn
13	8/25/2014	Adenta-Accra	MigrantIn
14	8/25/2014	Adenta-Accra	MigrantIn
15	8/25/2014	Adenta-Accra	MigrantIn
16	8/26/2014	Accra	MigrantIn
17	8/27/2014	Dzelukope	MigrantIn
18	9/3/2014	voiture entre Lomé et Notsie	Key Informant
19	9/4/2014	Notsie (Togo)	Key Informant
20	9/8/2014	Kedzi	Key Informant
21	9/8/2014	Keta	Key Informant
22	9/9/2014	Keta Municipal Assembly	Key Informant
23	9/9/2014	Keta Municipal Assembly	Key Informant
24	9/9/2014	Keta Municipal Assembly	Key Informant
25	9/10/2014	Keta	Key Informant
26	9/11/2014	Accra	Key Informant
27	9/17/2014	Keta	Key Informant
28	9/19/2014	Dzelukope	Key Informant

Annexes

29	9/22/2014	Community Questionnaire Keta	Community Questionnaire
30	9/22/2014	Community Questionnaire Kedzi	Community Questionnaire
31	9/22/2014	Community Questionnaire Blekusu	Community Questionnaire
32	9/23/2014	Community Questionnaire Anlo-Afiadenyigba	Community Questionnaire
33	9/23/2014	Community Questionnaire Tegbi	Community Questionnaire
34	9/24/2014	Community Questionnaire Anloga	Community Questionnaire
35	9/24/2014	Community Questionnaire Genui	Community Questionnaire
36	9/25/2014	Anloga	Key Informant

Interviews field research Indonesia 2015

No. Interview	Date	Type of respondent	Location
1	6/18/2015	Key Informant	Kelurahan Office Tanjung Mas
2	6/24/2015	Migrant HH	Tanjung Mas (Tambaklorok)
3	6/24/2015	Migrant HH	Tanjung Mas (Tambaklorok)
4	6/25/2015	Out-Migrants' HH	Tanjung Mas
5	6/27/2015	Migrant HH	Tanjung Mas
6	6/27/2015	Out-Migrants' HH	Tanjung Mas
7	6/28/2015	international return migrants	Tanjung Mas (Tambaklorok)
8	6/28/2015	In-Migrants (garment girls)	Tanjung Mas (Tambaklorok)
9	7/2/2015	Migrants' HH	Rejosari
10	7/2/2015	Key Informant	Rejosari
11	7/2/2015	international return migrants	Rejosari
12	7/2/2015	international return migrants	Rejosari
13	7/2/2015	In-Migrants' HH (?)	Rejosari
14	7/4/2015	Key Informant	Tanjung Mas
15	7/4/2015	Key Informant	Tanjung Mas
16	7/4/2015	In-Migrant / Out-Migrant's HH	Tanjung Mas
17	7/4/2015	Key Informant	Tanjung Mas
18	7/5/2015	Migrant HH	Tanjung Mas

19	7/5/2015	Migrant HH	Tanjung Mas
20	7/5/2015	MM Migrant HH	Tanjung Mas
21	7/5/2015	In-Migrant (garment girls)	Tanjung Mas
22	7/5/2015	In-Migrant (garment girls)	Tanjung Mas (Tambaklorok)
23	7/6/2015	Key Informant	Panggung Lor
24	7/6/2015	Out-Migrant's HH	Panggung Lor
25	7/6/2015	Return migrant	Tanjung Mas
26	7/8/2015	Out-/In-Migrant's HH	Panggung Lor
27	7/8/2015	In-Migrants HH	Panggung Lor
28	7/8/2015	international out-migrant	Panggung Lor
29	7/10/2015	Expert interview	Balai Kota SMG
30	7/10/2015	Out-Migrant's HH	Panggung Lor
31	7/10/2015	Out-Migrant's HH	Panggung Lor
32	7/10/2015	Migrant HH	Panggung Lor
33	7/10/2015	In-Migrant's HH	Panggung Lor
34	7/11/2015	Out-Migrant's HH	Panggung Lor
35	7/11/2015	Out-Migrant's HH	Panggung Lor
36	7/11/2015	Out-Migrant's HH	Panggung Lor
37	7/11/2015	Migrant HH	Panggung Lor
38	7/11/2015	Resettlement?	Sawah Besar
39	7/11/2015	Resettlement?	Sawah Besar
40	7/11/2015	Resettlement?	Sawah Besar
41	7/12/2015	Resettlement?	Karangroto
42	7/12/2015	Resettlement?/Return migrant	Karangroto
43	7/12/2015	Resettlement?	Karangroto
44	7/13/2015	Out-migrant	Tanjung Mas
45	7/13/2015	In-Migrant's HH	Rejosari
46	7/13/2015	Out-Migrant's HH	Rejosari
47	7/13/2015	Out-Migrant's HH	Rejosari
48	7/29/2015	In-Migrant's HH	Rejosari
49	7/29/2015	Expert interview	UNDIP
50	7/29/2015	Key Informant	Kelurahan Office Tanjung Mas
51	7/30/2015	MM Migrant HH	SMG Barat
52	7/30/2015	MM Migrant HH	Pedurungan
53	7/30/2015	MM Migrant HH	Pedurungan

54	7/31/2015	MM Migrant HH	Genuk
55	7/31/2015	MM Migrant HH	Genuk
56	7/31/2015	MM Migrant HH	Genuk
57	7/31/2015	Out-Migrant's HH	Rejosari
58	7/31/2015	MM Migrant HH	SMG Barat
59	8/5/2015	Expert interview	UNDIP
60	8/5/2015	Expert interview	UNDIP
61	8/6/2015	Key Informant	BLKI
62	8/9/2015	In-Migrants	Tanjung Mas
63	8/9/2015	In-Migrant	Tanjung Mas
64	8/10/2015	Key Informant	Tanjung Mas
65	8/10/2015	Key Informant	Tanjung Mas
66	8/10/2015	Key Informant	Tanjung Mas
67	8/10/2015	In-Migrant	Tanjung Mas
68	8/12/2015	Expert interview	Disnaker Kerja
69	8/12/2015	International migrant	Pedurungan
70	8/12/2015	In-Migrants	Rejosari
71	8/12/2015	In-Migrant	Rejosari
72	8/13/2015	In-Migrant	Rejosari
73	8/13/2015	In-Migrant	Rejosari
74	8/13/2015	In-Migrant	Rejosari
75	8/13/2015	In-Migrant	Rejosari
76	8/13/2015	In-Migrant	Rejosari
77	8/13/2015	In-Migrant	Rejosari
78	8/18/2015	Expert interview	BAPPEDA Kota Semarang
79	8/18/2015	Expert interview	Balai Kota SMG
80	8/19/2015	Expert interview	Retention Pond
81	8/19/2015	international return migrants	Taxi
82	8/20/2015	Expert interview	Disnaker Kerja
83	8/21/2015	In-Migrant	Tanjung Mas
84	8/21/2015	In-Migrant	Tanjung Mas
85	9/2/2015	Out-Migrant	Jakarta
86	9/2/2015	Out-Migrant	Jakarta
87	9/3/2015	Out-Migrant	Jakarta

88	9/3/2015	Out-Migrant	Jakarta

Interviews field research Ghana 2015/2016

No. Interview	Date	Typ of respondent	Location
1	12/1/2015	Migrant HH	Keta - Abutiakope
2	12/1/2015	Migrant HH	Keta Town
3	12/1/2015	Migrant HH	Keta - Tetekope
4	12/2/2015	Migrant HH	Keta - Town
5	12/2/2015	Migrant HH	Keta - Town
6	12/2/2015	Migrant HH	Keta - Town
7	12/2/2015	Migrant HH	Keta - Town
8	12/2/2015	Migrant HH	Keta (Busco)
9	12/2/2015	Migrant HH	Keta (Busco)
10	12/3/2015	Migrant HH	Kedzi
11	12/3/2015	Migrant HH	Kedzi
12	12/3/2015	Migrant HH	Kedzi
13	12/4/2015	Migrant HH	Kedzi
14	12/4/2015	Migrant HH	Kedzi
15	12/4/2015	Migrant HH	Kedzi
16	12/4/2015	Migrant HH	Kedzi
17	12/4/2015	Migrant HH	Kedzi
18	12/5/2015	Migrant HH	Blekusu
19	12/5/2015	Migrant HH	Blekusu
20	12/5/2015	Migrant HH	Blekusu
21	12/6/2015	Key Informant	Blekusu
22	12/6/2015	Migrant HH	Blekusu
23	12/6/2015	Migrant HH	Blekusu
24	12/6/2015	Migrant HH	Blekusu
25	12/6/2015	Migrant HH	Blekusu
26	12/7/2015	Migrant HH	Blekusu
27	12/7/2015	Migrant HH	Keta (Busco)
28	12/10/2015	market women	Keta market
29	12/16/2015	expert interview	Kedzi
30	12/16/2015	Key Informant	Kedzi

31	12/16/2015	Migrant	Keta (aus Tegbi)
32	12/18/2015	Focus group	Keta market
33	12/18/2015	Migrant HH	Keta
34	12/18/2015	Focus group	Blekusu
35	12/21/2015	Migrant	Kedzi
36	12/21/2015	Key Informant	Keta market
37	12/22/2015	Key Informant	Kedzi
38	12/22/2015	Return Migrant	Keta
39	12/23/2015	In-Migrant	Keta market
40	1/4/2016	Migrant	Kpeme (Togo)
41	1/6/2016	Return Migrant	Keta
42	1/6/2016	Return Migrant	Anloga
43	1/7/2016	Migrant who invests	Keta
44	1/7/2016	Key Informant	Denu
45	1/10/2016	Migrant who invests	Keta
46	1/12/2016	Migrant	Accra - Mayera
47	1/13/2016	Migrant (2nd generation)	Accra - Tudu
48	1/13/2016	Migrant	Accra - Tudu
49	1/13/2016	Migrant	Accra - Nungua Katamanto
50	1/15/2016	Migrant	Accra - Oyarifa
51	1/16/2016	Migrant	Accra - Asamansa(?)
52	1/16/2016	Migrant	Accra - Spintex
53	1/16/2016	Migrant	Tema - Marshal Camp
54	1/18/2016	Migrant	Accra - Labone
55	1/28/2016	Key Informant	Accra
56	1/29/2016	Migrant	Accra
57	1/29/2016	Migrant (2nd generation)	Accra - McCarthy Hill
58	2/2/2016	Migrant	Ho (Interview in Accra)
59	2/4/2016	Migrant HH – genealogy	Keta
60	2/4/2016	Migrant HH - genealogy	Keta
61	2/4/2016	Migrant HH - genealogy	Keta
62	2/5/2016	Migrant HH - genealogy	Kedzi
63	2/5/2016	Migrant	Kedzi (migrant in Ho)
64	2/5/2016	Migrant HH - genealogy	Kedzi
65	2/5/2016	Key Informant	Blekusu

66	2/5/2016	Migrant HH - genealogy	Blekusu
67	2/5/2016	Migrant HH	Anloga
68	2/6/2016	Migrant HH	Anloga
69	2/6/2016	Key Informant	Anloga
70	2/7/2016	Migrant	Ho
71	2/7/2016	Migrant	Ho
72	2/7/2016	Key Informant	Ho
73	2/8/2016	Migrant	Ho
74	2/8/2016	Migrant	Ho
75	2/8/2016	international migrant	Ho
76	2/8/2016	Migrant	Ho
77	2/8/2016	Migrant	Ho
78	2/8/2016	Migrant	Ho
79	2/10/2016	international migrant	Accra
80	2/11/2016	Migrant (2nd generation)	Accra
81	2/12/2016	international migrant	Accra

9.1.1 Guidelines qualitative interviews Ghana

1) Presentation Usha

Intro: Please tell me your personal migration history (when did you come here, how, why etc)

2) Migration history of the respondent

a. How long have you been living here? Where have you lived before, for how long? Could you draw your migration route for us? **(mapping on paper)**
b. Why did you migrate?
c. Did you have contacts to persons living abroad, here where you are now or in other places before? Do you know other people who migrated?
d. Did you change your occupation after the migration?

3) Role of the Family

a. Where do your siblings live?
b. Who decided that you should migrate and where to?
e. Who financed your migration?
f. What does/did your family think about your migration?
g. How many of your family members left? Who? Where to? When?
h. Are there any (international) migrants among HH members/relatives/friends?

i. How many men and women migrated from your family? Is there a difference in women´s / men´s migration?
j. Do you still keep contact with your family in Keta? How?
k. Do you send money home or support your family in other ways?

4) Migration myths/ migration narratives

a. What does migration mean to you? (Is migration part of your life, did you always want to move or is it rather something you wanted to avoid?)
b. What would it mean if you would (have) stay(ed)?
c. What were your hopes and fears before you migrated? What did happen in reality?
d. *To (international) migrants*: what was your imagination of XX (the place where you are now) before you left Keta? In how far did your perception change?
e. Do you know the migration saga of the Anlo-Ewe? If yes, what does it mean to you? Is there a link to your personal migration?

5) Migration industry – Actors in migration process

a. Who organized the migration (before leaving, during the journey and at destination)?
b. Where did you get the information where to go, how to get there etc.?
c. How did you choose your destination? How did you get there? What were maybe steps on your journey?
d. With whom were you in contact during that process (individuals & institutions)?
e. Would you consider your migration and all what you did to realize this journey „legal“ or were there also „illegal“ activities linked to it?
f. How long did/do you think your migration project should take (from decision to arrival)? How long did it take in reality?

6) Migration & Religion

a. What is your religious background?
b. Did you discuss your migration decision with your priest / religious leader?
c. Did your religion help you to find contacts during your journey or at destination or help in any other way?

7) Environmental Change / Climate Change / Coastal Erosion

a. Please tell me about your experiences with the sea & the lagoon in Keta. Were there any changes during the last 20 years? When? Which Changes?
b. Did you experience any other changes in the environment in the last 20 years (e.g. rainfall, temperature, salinization of the lagoon and ground water, cutting of mangroves and coconut trees)?
c. Why is the sea changing / destroying the coast in your opinion?
d. What should be done against the destruction by the sea in your opinion?
e. Did the changes of the coast/sea influence your migration?

8) Biographic Information of respondent

a. Age
b. Place of birth

c. Sex
d. Marital status
e. Profession
f. Relation to HH head Position among siblings:
g. Educational level (Diploma)

After interview:

i. **Do you know other migrants from Keta around here? Could you put us in contact with them?**

9.1.2 Guidelines qualitative interviews Indonesia

1) Presentation Usha
2) **Migration history** of respondent(`HH)
    a. How long have you been living here? Where have you lived before, for how long?
    b. Why did you move here? When?
    c. Who decided about the migration(s)?
    d. Did you change your occupation after the migration?
3) **Family**
    a. Where do the siblings of respondent/HH head live?
    b. Are there any (international) migrants among HH members/relatives/friends?
    c. What do/did you (your family) think about the migration?
4) **Contacts/Networks/Information**
    a. Where did you/the migrant get the information, how to get there/here?
    b. Who helped you to finance/organize the migration?
5) **Importance of migration vs. staying**
    a. What do you prefer moving around or staying at one place/your place of origin?
    b. Do you know any stories about migration?
    c. Do you know any stories about how Semarang/your community was founded/created?
6) **Religion**
    a. What is the link between (your) migration and your religion?
    b. According to Islam/Christianity is migration rather positive or negative?
7) **Environmental Change**
    a. What are your experiences with environmental change here?
    b. Lifted up the house /road? Who paid? How often?
    c. Why is there rob, banjir etc? What should be done?
    d. Is there a link between EC and your migration?
8) **Socio-econ. information of respondent**
    a. Age; Education, Marital status; Children; position in HH & siblings; occupation; place of birth

9.1.3 Angaben zum Eigenanteil

Hiermit bestätige ich, Usha Ziegelmayer, im Rahmen der hier vorgelegten Dissertation in Absprache mit meinen Koautorinnen und Koautoren folgenden Eigenanteil geleistet zu haben:

> Ziegelmayer U, Herbeck J and Hillmann F (2019) Environmental Studies and Migration. In: Inglis C, Li W and Khadria B (eds) *SAGE Handbook of International Migration*: Sage Publications Ltd, pp. 88–107. (accepted version, final version available at https://uk.sagepub.com/en-gb/eur/node/96739/#contents)

Ich bin in erster Linie für die Erstellung des Kapitels „Environmental Change in Migration Studies" verantwortlich, wobei ich mich auf vorliegendes von allen drei Autoren erarbeitetes Material gestützt habe. Ich bin zu gleichen Anteilen wie die beiden Co-Autor_innen für die Erstellung der „Concluding remarks" verantwortlich. Als Erstautorin übernahm ich die finale Redaktion der Veröffentlichung.

> Hillmann F and Ziegelmayer U (2016) Environmental change and migration in coastal regions: examples from Ghana and Indonesia. *DIE ERDE – Journal of the Geographical Society of Berlin* 147(2): 119–138. (accepted manuscript, final version available at https://doi.org/10.12854/erde-147-9)

Ich war für die die Erhebung der quantitativen und qualitativen Daten in Indonesien sowie deren Analyse bezüglich meines Promotionsprojektes verantwortlich. Die Erhebung der quantitativen Daten vor Ort erfolgte durch Kolleg_innen der Gadja Madah Universität. Die Erhebung der quantitativen Daten (Haushaltssurvey) in Ghana wurde von Kollegen des Forschungsprojekts „New Regional Formations" durchgeführt. Die Analyse dieser sowie die Erhebung und Analyse der qualitativen Daten aus Ghana lagen in meiner Verantwortung im Rahmen der Supervision durch die Ko-Autorin und der Vorbereitung der Empirie durch die Kooperationspartner. Die Erstellung des Kapitels „2.State of the art: Migration and Environmental Change" lag, unter Anleitung durch die Ko-Autorin, in meiner Verantwortung wie die Erstellung des 3. Kapitels zur Methodik inklusive der Beschreibung der beiden Forschungsregionen. Die Darstellung (4.) und Diskussion (5.) der Ergebnisse wurde in gemeinschaftlicher Verantwortung der Autorinnen erstellt. Die Karten und Tabellen in der Veröffentlichung wurden von mir erstellt (Tabellen) bzw. konzeptionell entworfen (Karten), von der Ko-Autorin ergänzt und vom Karthographieverbund der TU Berlin erstellt. Die Formulierung der „6. Conclusions" wurde von den Ko-Autorinnen zu gleichen Anteil erarbeitet.

Annexes

Ziegelmayer U and Spaan E (2018) Migrant trajectories within the context of demographic, socio-economic, and environmental change: Evidence from coastal Ghana. In: Hillmann F, van Naerssen T and Spaan E (eds) *Trajectories and Imaginaries in Migration: The Migrant Actor in Transnational Space*. Abingdon, Oxon, New York: Routledge, pp. 34–55. (accepted manuscript, final version available at https://www.taylorfrancis.com/chapters/edit/10.4324/9781351119665-3/migrant-trajectories-within-context-demographic-socio-economic-environmental-change-usha-ziegelmayer-ernst-spaan)

Ich bin für die gesamte Datenerhebung der der Veröffentlichung zugrundeliegenden Daten verantwortlich. Die Datenanalyse wurde ebenso vorwiegend von mir vorgenommen. Das Kapitel „2.2 Theoretical framework: migrant trajectories and household history“ wurde vorwiegend von mir erstellt. Die Die Entscheidung die Daten anhand des theoretischen Konzepts der migrant trajectories in Verbindung mit der Geschichte der Haushalte „household history“ zu analysieren basiert auf der Analyse erster Interviews einerseits, dem vorhandenen theoretischen Rahmen der migration trajectories sowie dem Vorschlag des Ko-Autors Dr. Ernst Spaan, der die Idee einbrachte, die Daten unter der Linse der „household history“ und dem Konzept von „linked lives“ (Kou et al., 2015) zu untersuchen.

Der in der Veröffentlichung dargestellte theoretische Rahmen „migrant trajectories embedded in household histories“ wurde von in erster Linie von mir entwickelt, von dem Ko-Autor ergänzt und graphisch von einem professionellen Designer nach meinen Angaben dargestellt.

Die Darstellung und Diskussion der Ergebnisse (Kapitel 4) inklusive ihrer Unterkapitel wurde zum Großteil von mir erstellt und in zwei Feedbackrunden vom Ko-Autor ergänzt und weiterentwickelt.

Die Erstellung der „5. Conclusions“ lag ebenso in erster Linie in meiner Verantwortung und wurde von Dr. Ernst Spaan ergänzt.

Usha Ziegelmayer

Berlin, August 2022