

BEYOND PANIC?

EXPLORING CLIMATE MOBILITIES IN SENEGAL, GUATEMALA, CAMBODIA AND KENYA

CASE STUDY REPORT

**#CLIMATE
OF CHANGE**



Co-funded by
the European Union



AUTHORS – UNIVERSITY OF BOLOGNA

Elena Giacomelli, *Post doc research fellow*

Elisa Iori, *Post doc research fellow*

Susanna Villani, *Post doc research fellow*

Sarah Walker, *Post doc research fellow*

Pierluigi Musarò, *Full Professor*

Matteo Vittuari, *Associate Professor*

Marco Borraccetti, *Associate Professor*

Elisa Magnani, *Associate Professor*

WITH THE CONTRIBUTION AND COORDINATION OF WEWORLD

Margherita Romanelli, *Coordinator of EU programmes and International Policies & Advocacy*

Natalia Lupi, *#ClimateOfChange Consortium Coordinator*

David Wiersma, *#ClimateOfChange Project Manager*

Rachele Ponzellini, *Communication Specialist WeWorld*

Marika Giudici, *Project Manager WeWorld Kenya*

Amos Otiego, *Communication Officer WeWorld Kenya*

Steve Kioko, *Project Officer WeWorld Kenya*

Rachel Sintamei, *Project Officer WeWorld Kenya*

Lavinia Viglietti, *Project Manager WeWorld Cambodia*

Stefano Piziali, *Head of Advocacy Policy Partnership and EU & Italian Programmes*

Stefania Piccinelli, *Head of International Programmes*

Andrea Comollo, *Head of Communications*

Methodological Note:

Numbers and percentages showed in tables are the result of rounding. Decimals are displayed only in the text.

This publication was produced within the framework of the #ClimateOfChange project - End Climate Change, Start Climate of Change – funded by the European Union under the DEAR (Development Education and Awareness Raising) Programme. The project, led by WeWorld and involving 15 partners from 13 EU countries aims to inform, raise awareness and activate youth on climate change and human mobility.

This publication was produced with the financial support of the European Union. Its contents are the sole responsibility of the University of Bologna and WeWorld and do not necessarily reflect the views of the European Union.



INDEX

06	LIST OF ACRONYMS
07	GLOSSARY
11	INTRODUCTION
18	METHODS
18	1. Research Team
18	2. The impact of COVID-19 on research activities
19	3. Preparing the field visits: desk analysis
19	3.1 Literature review
20	3.2 Remote research
22	4. Fieldwork in the four case studies
22	4.1 Focus groups
23	4.2 In-depth interviews with key informants
23	4.3 Visual storytelling
24	4.4 Climate Diaries
25	4.5 Household Surveys
26	5. Case Studies in detail
26	5.1 Senegal
26	5.2 Guatemala
27	5.3 Cambodia
27	5.4 Kenya
29	6. Capturing the complexities of migration
29	CASE STUDY 1: SENEGAL
35	7. Country Overview
37	7.1 Strategies for coping with environmental and climate change
38	7.2 National migration policy
40	8. Methods
41	8.1 Focus: Dakar and Saint Louis
43	9. Research findings
43	9.1 Hostile environment
49	9.2 Waste
55	9.3 Fishing
61	9.4 Mobility
68	10. Conclusions and solutions

70	CASE STUDY 2: GUATEMALA
72	11. Country Overview
74	11.1 Strategies for coping with environmental and climate change
76	11.2 National migration policy
77	12. Methods
78	12.1 Focus: Totonicapán e Momostenango; Sololá
78	13. Research findings
79	13.1 Insights from the survey
82	13.2 Indigenous and rural population
84	13.3 Inequalities and vulnerabilities related to gender
85	13.4 Hostile Environment
88	13.5 Agriculture and deforestation
89	13.6 The (mis)management of natural resources: exacerbating the problem
91	13.7 Water and waste
98	13.8 Human mobility in Guatemala: patterns and trends
102	13.9 Intertwining environment, climate change and migration
106	14. Conclusions and solutions
107	15. Appendix: Extracts from interviews
111	CASE STUDY 3: CAMBODIA
113	16. Country Overview
115	16.1 Strategies for coping with environmental and climate change
116	16.2 National migration policy
117	17. Methods
118	17.1 Focus: Battambang Province
120	18. Research findings
120	18.1 Insights from the survey:
126	18.2 Hostile environment
127	18.3 Deforestation
130	18.4 Water governance and irrigation
131	18.5 Erratic rainfall
137	18.6 Debt and Microfinance
140	18.7 Human mobility in Cambodia: patterns and trends
141	18.8 Mobility
145	18.9 Climate Change and Migration: a Gender Perspective
149	18.10 Impact of COVID-19
151	19. Conclusions and solutions

153	CASE STUDY 4: KENYA
155	20. Country Overview
157	20.1 Pastoralism in Kenya
158	21. Strategies for coping with environmental and climate change
161	21.1 National (environmental) migration policy
164	22. Methods
165	22.1 Focus: Isiolo County
166	23. Research findings
166	23.1 Hostile Environment
170	23.2 Internal conflicts for resources
171	23.3 Adaptation to climate change for (im)mobile people
176	24. Conclusions and solutions
177	25. Appendix: Aletta Manemane climate diary
179	CONCLUSIONS: Four countries, common patterns and heterogeneous experiences
184	RECOMMENDATIONS
187	BIBLIOGRAPHY
187	Introduction
190	Senegal
194	Guatemala
198	Cambodia
201	Kenya
202	Conclusions
203	APPENDIX I: Remote interviews from July to September 2020
205	APPENDIX II: Structure of focus groups
206	APPENDIX III: Structure of semi-structured interviews
209	APPENDIX IV: Survey questionnaire

LIST OF ACRONYMS

<i>ACA</i> = US-Guatemala Asylum Cooperative Agreement	<i>IGO</i> = Intergovernmental Organisation
<i>ANSD</i> = Agence Nationale de Statistique et de la Démographie	<i>INAB</i> = National Institute of Forests
<i>ASEAN</i> = Association of South-East Asian Nations	<i>INSIVUMEH</i> = Instituto Nacional de Sismología, Vulcanología, Meteorología e Hidrología de Guatemala
<i>ASEM</i> = Asia-Europe Meeting	<i>IO</i> = International Organization
<i>AU</i> = African Union	<i>IOM</i> = International Organisation for Migration
<i>CAFTA-DR</i> = Central America-Dominican Republic Free Trade Agreement	<i>IPCC</i> = Intergovernmental Panel on Climate Change
<i>CCAD</i> = Comisión Centroamericana de Ambiente y Desarrollo	<i>MAPA</i> = Most Affected People and Areas
<i>CCCA</i> = Cambodia Climate Change Alliance	<i>MARN</i> = Ministerio de Ambiente y Recursos Naturales
<i>CERGE</i> = Climate Resilient Green Economy	<i>MDGs</i> = Millennium Development Goals
<i>CNCC</i> = Consejo Nacional de Cambio Climático	<i>MFF</i> = EU Multiannual Financial Framework
<i>CONADUR</i> = Consejo Nacional de Desarrollo Urbano y Rural	<i>MECC</i> = Migration, Environment and Climate Change
<i>CONAP</i> = National Council of Protected Areas	<i>MIP</i> = Latin America regional Multiannual Indicative Programme
<i>CRED</i> = Centre for Research on the Epidemiology of Disasters	<i>NAMA</i> = Nationally Appropriate Mitigation Actions
<i>CRS</i> = Congressional Research Service	<i>NGO</i> = Non-Governmental Organization
<i>CVF</i> = Climate Vulnerable Forum	<i>OAS</i> = Organization of American States
<i>DCI</i> = Development Cooperation Instrument	<i>OAU</i> = Organization of African Unity
<i>EC</i> = European Community	<i>OCAM</i> = Central American Commission of Directors of Migration
<i>EU</i> = European Union	<i>RCM</i> = Regional Conference on Migration
<i>ECOWAS</i> = Economic Community of West African States	<i>SACM</i> = South American Conference of Migration
<i>FAO</i> = Food and Agriculture Organisation	<i>SICA</i> = Sistema de la Integración Centroamericana
<i>GCCA</i> = Global Climate Change Alliance	<i>UN</i> = United Nations
<i>GCF</i> = Green Climate Fund	<i>UNDP</i> = United Nations Development Programme
<i>GDP</i> = Gross Domestic Product	<i>UNFCCC</i> = United Nations Framework Convention on Climate Change
<i>GGW</i> = Great Green Wall	<i>UNHCR</i> = United Nations High Commissioner for Refugees
<i>GEF</i> = Global Environmental Facility	<i>URL</i> = Rafael Landívar University
<i>GFMD</i> = Global Forum on Migration and Development	<i>WAEMU</i> = West African Monetary and Economic Union
<i>IARNA</i> = Instituto de Ambiente y Recursos Naturales	<i>WTO</i> = World Trade Organisation
<i>IDCM</i> = Internal Displacement Monitoring Centre	
<i>IDGT</i> = Instituto de Investigación y Proyección sobre Dinámicas Globales y Territoriales	
<i>IDP</i> = Internally displaced people	
<i>IGAD</i> = Intergovernmental Authority on Development	

GLOSSARY

CLIMATE / ENVIRONMENTAL CHANGE¹:

CLIMATE: The statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. The classic period for averaging these variables is 30 years, as defined by the World Meteorological Organisation. The relevant quantities are most often surface variables such as temperature, precipitation and wind. Climate in a wider sense is the state, including a statistical description, of the climate system.

ENVIRONMENT: The environment is the totality of all the external conditions affecting the life, development and survival of an organism.

CLIMATE CHANGE: A change in the state of the climate that can be identified (for example, using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity.

ENVIRONMENTAL CHANGE: Change or disturbance of the environment both at the local and the global level most often caused by human activities and natural processes, including natural disasters and animal interaction.

CLIMATE CHANGE INDUCED MIGRATION: Migration that can be attributed largely to the slow-onset impacts of climate change on livelihoods owing to shifts in water availability and crop productivity, or to factors such as sea level rise or storm surge.

CLIMATE RISK: Potential for consequences from climate variability and change where something of value is at stake and the outcome is uncertain. Often represented as the probability that a hazardous event or trend occurs multiplied by the expected impact. Risk results from the interaction of vulnerability, exposure, and hazard.

RAPID-ONSET EVENT: Event such as cyclones floods, tsunami and typhoons which take place in days or weeks

RISK: Potential for loss, damage, or destruction of an asset as a result of a threat exploiting a vulnerability. Thus, it comprises a threat and a vulnerability of an asset (Threat x Vulnerability = Risk).

SLOW-ONSET CLIMATE CHANGE: Changes in climate parameters—such as temperature, precipitation, and associated impacts, such as water availability and crop production declines—that occur over long periods of time, examples of slow-onset events include droughts, desertification and rise-sea level.

THREAT: Any natural or man-made circumstance that could have an adverse impact on an organisational asset.

VULNERABILITY: The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity and resources to cope and adapt.

1. From World Bank climate knowledge portal glossary: https://climateknowledgeportal.worldbank.org/themes/custom/wb_cckp/resources/data/CCKP_Glossary_Oct_2018.pdf

MIGRATION²:

ASYLUM SEEKER: An individual who is seeking international protection. In countries with individualised procedures, an asylum seeker is someone whose claim has not yet been finally decided on by the country in which he or she has submitted it. Not every asylum seeker will ultimately be recognized as a refugee, but every recognized refugee is initially an asylum seeker.

CIRCULAR MIGRATION: A form of migration in which people repeatedly move back and forth between two or more countries. Can also be used as a coping strategy in the context of climate change and environmental degradation, a means to help supplement local incomes. When living conditions deteriorate as a result of the effects of natural hazards, environmental degradation or climate change, individuals and families may resort to mobility-based strategies to reduce risk and build resilience by seeking alternative opportunities within their country or abroad. Managed properly, circular or temporary migration can be effective in helping people protect life and assets, access assistance and livelihood opportunities and progressively return to normalcy as conditions allow. Migration can also support resilient recovery in communities and countries of origin by allowing migrants to send back remittances and return home with newly acquired knowledge, technology and skills (see *The Nansen Initiative, Agenda for the Protection of Cross-Border Displaced Persons in the Context of Disaster and Climate Change (2015) p. 9*)

CLIMATE MIGRATION: The movement of a person or groups of persons who, predominantly for reasons of sudden or progressive change in the environment due to climate change, are obliged to leave their habitual place of residence, or choose to do so, either temporarily or permanently, within a State or across an international border.

Note: *This is a working definition of the International Organisation for Migration with an analytic and advocacy purpose which does not have any specific legal value.*

Climate migration is a subcategory of environmental migration; it defines a singular type of environmental migration, where the change in the environment is due to climate change. However the relation between climate change and migration is complex, sometimes very difficult to detect and cannot be reduced to single cause-effect dimension. Migration in this context can be associated with greater vulnerability of affected people, particularly if it is forced. Yet, migration can also be a form of adaptation to environmental stressors, helping to build resilience of affected individuals and communities.

CLIMATE REFUGEE: This term is now largely discredited, mainly as it is not a term of art in international law. Individuals forced to leave their country because of environmental or climatic processes or events do not meet the legal definition of 'refugee'. Beyond a few exceptional cases, the national governments are generally willing to protect them, even if it may be unable to do so, and they are not persecuted on any of the Convention's grounds. Moreover, most of those who flee environmental degradation or disaster, including when due to climate change, do not cross an international border, which is an additional requirement for the application of the refugee definition (McAdam, 2009 in IOM, 2019, p. 32). In any case, they could benefit from a special protection depending on the legal instruments existing in the State of destination.

However, – this term is used by NGOs as a campaign and advocacy tool to highlight the plight of those forced to leave their homes due to climate change.

However, in January 2020 a landmark ruling by the UN Human Rights Committee found it is unlawful for governments to return people seeking asylum from countries where the climate crisis threatens their lives³.

2. From IOM (2019) *Migration glossary* <https://www.iom.int/glossary-migration-2019>

The judgement relates to the case of a man from the Pacific nation of Kiribati, **which is considered one of the countries most threatened by rising sea levels**. He applied for asylum in New Zealand in 2013. Whilst his asylum claim was not successful, the Committee's decision included the recognition that "without robust national and international efforts, the effects of climate change in receiving states may expose individuals to a violation of their rights under articles 6 or 7 of the Covenant, thereby triggering the non-refoulement obligations of sending states"⁴.

CONVENTION RELATING TO THE STATUS OF REFUGEES (1951): known also as Geneva Convention, it spells out who is a refugee and the kind of legal protection, other assistance and social rights a refugee is entitled to receive. The Convention has been later amended by the 1967 Protocol which removes the geographical and time limit.

ENVIRONMENTAL MIGRANT: "A person or group(s) of persons who, predominantly for reasons of sudden or progressive changes in the environment that adversely affect their lives or living conditions, are forced to leave their places of habitual residence, or choose to do so, either temporarily or permanently, and who move within or outside their country of origin or habitual residence." (IOM, 2014)

CROSS-BORDER/INTERNALLY DISPLACED PERSONS: Persons or groups of persons who have been forced or obliged to flee or to 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 generalised violence, violations of human rights or natural or human-made disasters, and who have/have not crossed an internationally recognized State border.

MIGRANT: An umbrella term, not defined under international law, reflecting the common lay understanding of a person who moves away from his or her place of usual residence, whether within a country or across an international border, temporarily or permanently, and for a variety of reasons.

There are many different ways to interpret the term 'migrant' and there is no internationally accepted legal definition. The use of the term 'migrant' in the public discourse in Europe is extremely loose and often conflates issues of immigration status, race, and asylum (Anderson and Blinder, 2019)⁵.

MIGRATION AS ADAPTATION: migration is recognized under the United Nations Framework Convention on Climate Change (also known as the Cancun Adaptation Framework) (2010) as a strategy of adaptation, i.e. of "adjustment to actual or expected" environmental changes (IPCC, 2014:5). However, the ownership of an initial capital can be a prerequisite for emigration, rendering this adaptation strategy difficult to access for the most vulnerable persons. In other cases, migration can amplify existing vulnerabilities (IOM, 2014).

MITIGATION AND ADAPTATION STRATEGIES: Indigenous, local and traditional knowledge systems and practises, including indigenous peoples' holistic view of community and environment, are a major resource for adapting to climate change, but these have not been used consistently in existing adaptation efforts. Integrating such forms of knowledge with existing practises increases the effectiveness of adaptation. IOM (2014).

3. UN Human Rights Committee, Views adopted by the Committee under article 5 (4) of the Optional Protocol, concerning communication No. 2728/2016, 7 January 2020, CCPR/C/127/D/2728/2016. <https://www.theguardian.com/world/2020/jan/20/climate-refugees-cant-be-returned-home-says-landmark-un-human-rights-ruling>

4. https://tbinternet.ohchr.org/_layouts/15/treatybodyexternal/Download.aspx?symbolno=CCPR%2fC%2f127%2fD%2f2728%2f2016&Lang=en

5. <https://migrationobservatory.ox.ac.uk/wp-content/uploads/2017/01/Briefing-Who-Counts-as-a-Migrant-Definitions-and-their-Consequences.pdf>

Increasing efforts to mitigate and adapt to climate change imply an increasing complexity of interactions, particularly at the intersections among water, energy, land use and biodiversity, but tools to understand and manage these interactions remain limited. Examples of actions with co-benefits include (i) improved energy efficiency and cleaner energy sources, leading to reduced emissions of health-damaging, climate-altering air pollutants; (ii) reduced energy and water consumption in urban areas through greening cities and recycling water; (iii) sustainable agriculture and forestry; and (iv) protection of ecosystems for carbon storage and other ecosystem services.

PRINCIPLE OF NON-REFOULEMENT: core principle of refugee law which asserts that a refugee should not be returned to a country where they face serious threats to their life or freedom on account of his race, religion, nationality, membership of a particular social group or political opinion. This protection may not be claimed by refugees who are reasonably regarded as a danger to the security of the country, or having been convicted of a particularly serious crime, are considered a danger to the community. Enshrined in Article 33 of the Geneva Convention, it is now considered a rule of customary international law and thus binds all the Member States of the international community regardless of whether they have acceded to the 1951 Convention or 1967 Protocol.

REFUGEE: a legal category defined under international law under the 1951 Geneva Convention as: “person who, owing to a well-founded fear of persecution for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country; or who, not having a nationality and being outside the country of his former habitual residence as a result of such events, is unable or, owing to such fear, is unwilling to return to it.” (Article 1A/2).

INTRODUCTION

Who is the climate migrant? And how can we discuss the complex nexus between the climate crisis and migration in a manner that is productive and beneficial to those whose lives and livelihoods are most at risk from the climate crisis? These are some of the questions that this report grapples with and that have been the focus of much discussion throughout the *#ClimateOfChange* project, for which this report is produced. Questions that, sadly, as with all things related to discussions on migration, are deeply political in their nature. In seeking to answer them, we draw upon empirical research from four case study countries: Cambodia, Guatemala, Kenya and Senegal. Research was conducted by the interdisciplinary research team based at the University of Bologna, drawing upon combined sociological, agricultural and food systems, human-geographical, and legal perspectives, together with partner organisations on the ground where we were unable ourselves to conduct fieldwork in the case study countries due to the COVID-19 pandemic.

People have been moving in response to changes in their environment, often seasonally, for centuries. Indeed, *The Atlas of Environmental Migration* (Ionesco, Mokhnacheva and Gemenne, 2016), gives examples dating as far back as 45,000 years ago, when environmental changes and natural **disasters** played a role in how the population was distributed. Yet it is only in the last 20 years or so that the international community has begun to slowly recognize the wider linkages and implications that a changing climate and environment has on human mobility (Laczko and Aghazarm, 2009). More recently, increasingly alarmist narratives of ‘climate migrants’ as an invasive threat, moving in large numbers from the Global South to the Global North, have emerged.

Moreover, the ongoing COVID-19 global pandemic has exposed the failure to understand the mutually affective connection between humans and nature. Human-led environmental destruction has widely been found to have led to the conditions

that resulted in the pandemic (Chakraborty and Maity, 2020; Pendergrass and Vetesse, 2020; United Nations Environment Programme and International Livestock Research Institute, 2020). The intertwining of issues is clear, and, as Pendergrass and Vetesse (2020) stress, rather than a separate COVID-19 crisis and a climate crisis there is but one single, unified environmental crisis. The same toxic economic forces are at the heart of both (Ibid). In its most recent report, the Intergovernmental Panel on Climate Change (IPCC) (2021) concludes that human activity is changing the climate in unprecedented and sometimes irreversible ways. Defined as a “code red for humanity” by UN Secretary General António Guterres, the report warns of increasingly extreme heatwaves, droughts and flooding, and a key temperature limit being exceeded in just over a decade. Yet whilst the climate crisis may be one across the globe, the impacts are not felt in the same manner.

The Centre for Research on the Epidemiology of Disasters (CRED) found that people in the poorest countries are on average six times more likely than people in rich nations to be injured, lose their home, be displaced or evacuated, or require emergency assistance as a result of disasters (2018). Thus, the human cost of climate change falls overwhelmingly on low and lower-middle income countries: vulnerability to risk and degrees of suffering are determined by levels of economic development rather than climate per se (CRED, 2018). Indeed, UN Special Rapporteur Philip Alston, in UNHRC report on climate change and poverty (UNHRC, 2019), highlighted an “increasing risk of climate apartheid”. There is deep inequality in the impact of natural disasters, for example, researchers have shown that Hurricane Katrina and subsequent population displacements in the US had much more to do with social and political causes, including racial inequalities, than with narrowly natural ones. In October 2021, the UN Human Rights Council recognized the universal right to a safe, clean, healthy, and sustainable environment and created a Special Rapporteur on

human rights and climate change. This right is not available to many people the world over, particularly people of colour.

Mobility too is experienced in dramatically different ways across the globe. As Hirst and Thompson pointed out in 1999, states still control their borders and the movement of people across them, and so, despite the rhetoric of globalisation, “the bulk of the world’s population lives in closed worlds, trapped by the lottery of birth”. Thus, the freedom to move has become a stratifying factor of today’s world (Bauman 1998; Mezzadra and Neilson, 2013) and those groups whose spontaneous mobility is considered suspect may be subject to enforced immobility (Musarò, 2019). The passport index⁶ is indicative of the vast disparities in mobility experienced across the globe. Its rankings are based on the number of destinations their holders can access; All four case study countries rank very low in this index. Thus, for example, whilst a young person from the European Union may travel across the globe with relative ease for work or study, to enhance their employment prospects, or life experiences, youth in these areas may not.

To ‘de-naturalise’ the climate crisis, often portrayed as natural disasters which invisibilise both the socio-political responsibilities and the global inequalities at the heart of the crisis, our research draws on sociologist Mimi Sheller’s concept of ‘**mobility justice**’ (2018). This expands the notion of climate justice, broadening our understanding to include climate change, unsustainable urbanisation and unsustainable bordering systems as a combined crisis.

The concept reflects the interconnecting strands that emerge from the project: the right to mobility, the right to live in a healthy environment, and the unequal access to such rights across the globe. This approach recognises the impact of colonialism on both mobilities and places, and that adaptive capacity is highly uneven, mediated by intersectional considerations, such as one’s position in relation to capital, gender, ethnicity, class, race (Boas et al., 2019).

Indeed, **intersectional factors**⁷ play a key role in the impact of the climate crisis: ‘Vulnerable communities are not homogenous; instead, they are gendered intersectional (by class, race, Indigeneity, migrant status, etc.)’ (Sultana, 2021, p. 3). The effects of the climate crisis are often gendered (Lama et al., 2021; Ajibade and Siders, 2021). For example, the ecological and health burdens of flooding or water scarcity are disproportionately borne by women because of their greater domestic duties and gendered roles in the household (Ajibade and Siders, 2021). It is also recognised that women are mostly responsible for finding in-place solutions as men migrate to urban areas in search of opportunities and that this then increases the burden of responsibilities on women such as their share of agricultural work, water management, and household chores. Additionally, race and ethnicity play a role, and indigenous communities are most affected by the climate crisis. Globally, communities of colour are most exposed to toxins and pollutants (Beyond Plastics, 2021). Engagement with intersectionality draws out the intertwined systems of oppression and exploitation that enhance vulnerabilities

6. <https://www.passportindex.org/>

7. *The concept of intersectionality describes the ways in which systems of inequality based on gender, race, ethnicity, sexual orientation, gender identity, disability, class and other forms of discrimination “intersect” to create unique dynamics and effects (CIJ - Center for intersectional justice).*

DEFINITIONS AND DATA CHALLENGES

There is significant critical scholarship of the nexus between the climate crisis and migration (Geddes et al., 2012; Baldwin, 2013; Bettini, 2013; Boas et al., 2019; Durand-Delacré et al., 2021) and scholars have shown that, ‘categorizing climate migrants as distinguishable from non-climate migrants is not empirically possible’ (Boas et al. 2019, p. 902). There is no direct link and for many people, migration can be a continual process rather than a one-off decision and action, and the factors that influence decision-making around migration are complex and numerous (Kelman, 2020). As yet, there are insufficient empirical studies and robust models to establish a set of unquestionable causalities between climate change and migration (Boas et al., 2019; Renou and Diallo, 2019; Durand-Delacré et al., 2021). Following a review of published studies on the subject, the IPCC concludes, on the basis of the complex multicausal nature of migration, that “It is difficult to categorize any individual as a climate migrant” and that “there is widespread agreement in the scientific and legal literature that the use of the term climate refugee is scientifically and legally problematic” (2014, p. 771). **Thus, for the IPCC, the ‘climate refugee’, or ‘climate migrant’ does not exist.**

Distinguishing the role of slow-onset environmental phenomena in future migration is subject to significant uncertainties, given the multiple factors at play in decisions to migrate and in long-term development processes (Flavell, et al., 2020). Data on displacement in the context of sudden-onset natural disasters are more widely available, but are often limited to estimates of numbers displaced, and often do not indicate duration or geographical patterns of displacement or provide insights into the impacts on people’s vulnerability. The Internal Displacement Monitoring Centre (IDMC) provides annual estimates for the number of people newly displaced within their country by sudden-onset events (floods, earthquakes etc.), but these are subject to a number of limitations. This leaves a considerable margin for

inaccuracies, including lack of data on distance, duration and severity of displacement, and the risk of duplicate counting where multiple disasters affect the same location within a given year (Flavell et al., 2020). However, whilst it might not be possible to identify direct casualty, it is evident that the climate crisis both directly and indirectly shapes human mobility and that the negative impacts of the crisis are increasing.

The recent World Bank Groundswell report (2021) finds that climate change is an influencing factor in internal migration and estimates that by 2050 approximately 216 million people may be forced to leave their home.

216

MILLION PEOPLE

may be forced to leave their home

It is important to note here that this figure relates to internal migration, and not cross-border, as these movements are often framed. Yet despite this focus, alarmist narratives continue to lead to migrants being portrayed as ‘threats’ from the Global South to North, when, in reality, **the vast majority of movements are internal**, or to neighbouring countries. There is also a growing understanding that some of the people most vulnerable to environmental changes are, and will be, unable to move, as mobility also depends upon social and economic capital. Again, these more nuanced messages are often lost in media discourses, and numbers are (mis)used to exacerbate fear narratives (Boas et al., 2019; Durand-Delacré et al., 2021; Lietaer and Durand-Delacré, 2021). As Baldwin and Bettini highlight, climate change itself is portrayed as ‘a migration crisis in the making’ (2017, p. 1).

Despite significant critical scholarship of the nexus, ‘climate-induced migration’ is now a com-

mon rationale for enhancing border control in the Global North (Boas et al. 2019). **Resources going towards border enforcement compared with resources going into climate mitigation are significantly higher.** The priority is security (von Lucke, 2021) and can be seen in increasing militarization of borders (Miller et al., 2021). The EU budget for the management of external borders, migration and asylum for 2021-2027 increased by 2.6 times, amounting to more than 34.9 billion Euros, compared to 13 billion Euros for 2014-2020.

x2.6 **TIMES THE EU BUDGET**
for management of border,
migration and asylum

Recent market research reports project the compound annual growth rate for this global border security market to be between 7.2 and 8.6 % (65 to 68 million US dollars) in 2025 (Market Research Future, 2019 in OHCHR, 2020).

BETWEEN 7.2/8.6%
growth rate for global border security market

Oxfam’s research into funding allocated via the European Commission’s EU Trust Fund for Africa, reveals that spending of Official Development Assistance (ODA) is increasingly being tied to the EU’s desire to stop irregular migration (Raty and Shilhav, 2020)⁸. Critique of this fund is also prevalent in scholarship (Nshimbi and Moyo, 2016; Mager, 2018; Zardo, 2020).

The recent Transnational Institute report (Miller et al., 2021), finds that the world’s biggest emitters of greenhouse gases are spending on average, 2.3 times as much on arming their borders as they are on climate finance. Seven countries in particular – responsible for 48% of the world’s historic greenhouse gas (GHG) emissions – collectively spent at least twice as much on border and immi-

gration enforcement (more than \$33.1 billion) as on climate finance (\$14.4 billion) between 2013 and 2018. According to the Climate Equity Calculator, the US is currently the source of 30% of GHG emissions; the EU, 18%; China, 16%; Japan, 4%; Canada, 3%; and Australia, 2% (in Miller et al., 2021).

7 COUNTRIES → **48%** GHG EMISSION

This report will unpick some of the realities behind the scaremongering headlines about so-called ‘climate migrants’ through a focus on four case study countries, in which the lived reality of the climate crisis is already being felt. The report draws on the perceptions and lived realities of climate vulnerable people in the four countries with the aim of centralising their views. In these countries, for the people on whom this report focuses, the climate crisis is not a future threat, as for many countries in Europe, although even here wildfires, droughts and coastal erosion are increasingly occurring. For the people in this report, the climate crisis is a reality of the here and now and demands attention and policy responses right now. Policy responses, however, that are nuanced and balanced and do not fall into crisis emergency narratives which risk framing people compelled to move as a threat. The report takes a bottom-up approach, aiming to improve knowledge drawing from an evidence base that is not based solely upon (male) Global North based academics and to include voices from the Global South (Schipper et al., 2021).

8. The European Union Emergency Trust Fund for stability and addressing root causes of irregular migration and displaced persons in Africa (EUTF for Africa) was created to address the root causes of instability, forced displacement and irregular migration and to contribute to better migration management. See: https://ec.europa.eu/trustfundforafrica/index_en.

LEGAL FRAMEWORKS TO ADDRESS CLIMATE MOBILITIES: THE CURRENT CONTEXT

The international community has long been reluctant to include the reality of human mobility in the context of disasters and adverse effects of climate change within those legal documents specifically dedicated to migration issues. However, the trend has progressively changed. Indeed, a range of high-level commitments, policy instruments, stakeholder partnerships, and mechanisms already exist that provide guidance on how to address internal and cross-border displacement related to the adverse effects of the climate crisis. Some of the existing frameworks are outlined below.

In 2015, the Nansen Initiative on Disaster-Induced Cross-Border Displacement and its successor, the Platform on Disaster Displacement, were instrumental in putting climate change and disaster displacement on the global policymaking map. These State-led yet bottom-up consultative processes involving government officials, experts, affected communities, and civil society have helped to generate and coordinate research on disaster displacement, and have led to more nuanced understandings about the phenomenon. In turn, they have secured the inclusion of important references to disasters, climate change, and human mobility in a number of hard and soft law international instruments. They include: the Sendai Framework for Disaster Risk Reduction 2015–2030; the 2030 Agenda for Sustainable Development; the Agenda for Humanity, annexed to the UN Secretary-General's report for the 2016 World Humanitarian Summit.

The 1951 **Convention Relating to the Status of Refugees**, also known as the **Geneva Convention of 28 July 1951** or the **1951 Refugee Convention** provides legal protection for people forced to migrate within very specific parameters. Environmental reasons do not fall within the scope of the Convention. Two new instruments regulating migration were adopted in 2018: the Global Compact for Safe, Orderly and Regular Migration (Migration Compact) and the Global Compact on Refugees

(Refugee Compact). While the latter does not deal with environmental mobility, the Migration Compact, drawing expressly on the recommendations of the Nansen Initiative, sets out the need to: (a) strengthen information sharing and analysis to better understand and address mobility in the context of disasters, climate change, and environmental degradation; (b) develop adaptation and resilience strategies, which may include migration; (c) integrate displacement considerations into disaster preparedness strategies; (d) ensure access to humanitarian assistance and promote sustainable outcomes that increase resilience and self-reliance; and (e) develop coherent approaches to address the challenges of migration in this context.

The Global Compacts are not legally binding and therefore their implementation relies on the political will of the States. However, even though there are still some grey areas (i.e. with reference to regular entry routes), the Migration Compact in particular may be a 'ray of hope' since it has the potential to be 'the centre of gravity for future discussions and actions on disaster- and climate change-related human mobility' (Kälin 2018). Particularly, objective 5 enshrines the commitment to enhancing regular migration pathways, including for 'migrants in a situation of vulnerability' (para 21). Further, States 'commit to adapt options and pathways for regular migration in a manner that facilitates ... and responds to the needs of migrants in a situation of vulnerability, with a view to expanding and diversifying availability of pathways for safe, orderly and regular migration' (para 21). To realise this commitment, States can draw on a range of actions, including developing or building 'on existing national and regional practises for admission and stay ... for migrants compelled to leave their countries of origin owing to sudden-onset natural disasters and other precarious situations' (para 21(g)). There is explicit mention of cross-border planned relocation or visa options for permanent stay (para 21(h)).

An indirect reference to the relationship between climate change and individuals appears in the preamble of the **2015 Paris Agreement**, acknowledging that climate change is a common concern of humankind. Accordingly, 'the Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on human rights, the right to health, the rights of indigenous peoples, local communities, migrants [...]'. Following the entry into force of the Paris Agreement, a Task Force on Displacement of the Warsaw International Mechanism for Loss and Damage was also launched in 2017 as part

of the United Nations Framework Convention on Climate Change (UNFCCC) process 'to develop recommendations for integrated approaches to avert, minimise, and address displacement related to the adverse impacts of climate change'. Despite these commitments, during the last COP26 held in Glasgow in November 2021, no explicit references to the phenomenon of climate-induced migration, nor to the needs of the communities most affected by climate change were promoted, thus slowing down the process of raising awareness about this challenge at the global level.

THE FOUR CASE STUDIES: CAMBODIA, GUATEMALA, KENYA AND SENEGAL

Case study countries were chosen owing to their geographical location and vulnerability to the climate crisis. Located in the tropical belt, all four countries are experiencing natural disasters with increased frequency and intensity. The impacts of such disasters are then compounded by lack of adaptive capacity. Selected areas within each country were chosen to examine mobility patterns and the possible nexus with climate change. Migration patterns are geographically and historically specific to each case study area: in Senegal focus was placed upon areas that are both migrant arrival and transit destinations, including for irregular migration to Europe; in Kenya, the focus was on nomadic pastoralists who are less able to adapt to changes in the environment as they are tied to their animal herds, and hence are more prone to migrate locally; in Cambodia and Guatemala, aside from internal migration patterns relating to temporary/ seasonal work, where international migration occurs it is strongly regional and thus focus was placed on specific regions to examine this.

CAMBODIA:

Cambodia is consistently ranked among the top ten countries most vulnerable to climate change, predominantly due to lack of adaptive capacity. It

remains highly susceptible to climate change as a large part of the population is still dependent on the farming and fisheries sectors, which are predominantly rainfed, and the mainly rural population is largely dependent on natural resources for food, shelter and income which makes them highly vulnerable to climate change. The country has one of the fastest growing economies in the world, but growth has been very unequal across the population and is characterised by widespread land-grabbing, significant environmental destruction, and marginalisation of the poor, minorities, and indigenous peoples. Many Cambodians would prefer to stay in Cambodia and remain closer to their families, but as there are insufficient job opportunities in Cambodia's urban areas, and the climate crisis and socio-economic factors are reducing agricultural livelihoods, many Cambodians are compelled to migrate. In the selected area of Battambang, migration is predominantly to Thailand and often irregular.

GUATEMALA:

Guatemala is also listed among the world's 10 most vulnerable countries to the effects of climate change. The country is experiencing rural environmental degradation, due also to depletion and exploitation of natural resources, especially

due to mono-cultural expansion and deforestation. The largest migratory movements are internal, from rural-to-rural communities: people move both permanently or temporarily (for seasonal work on coffee or sugar plantations, for example) but there is also an increase in migrants intercepted at US border, in particular families and unaccompanied minors⁹.

KENYA:

In Kenya, internal migration is significant and manifests mainly as rural–urban owing to a number of factors, including internal conflicts and natural disasters. In particular, drought and floods are causing significant displacement, especially among pastoralists who experience frequent loss of livestock and limited access to land, resources, and markets. The use of evictions to realise development and environmental protection projects have also contributed to displacement, driving people off private, public, and communally owned land in both urban and wilderness areas. Although Kenya is considered a lower middle-income country, key challenges continue to be seen in the country’s inequality and poverty levels, which has increased the country’s economic vulnerability to shocks. This is leading some people to migrate beyond Kenya’s borders towards neighbouring States or Europe in search of a livelihood.

SENEGAL:

Senegal is highly environmentally fragile and faces concomitant sea level rise, coastal erosion, soil salinization, maritime storms and depletion of fish stocks and biodiversity. The country has a high incidence of climate-sensitive economic activities, including farming and fishing. This is due to the high population density and the concentration of almost all economic activities in coastal areas. The case study areas of Dakar and Saint Louis were purposefully selected to capture some of the complexities of mobilities and the interaction of the climate crisis with historical mobility patterns. Rural migrants from Senegal’s internal regions migrate to these urban coastal areas to work, often in the fishing industry to finance their agricultural activities. Once seasonal, these historical mobility patterns are shifting through the combined impacts of the climate crisis and socio-economic structural factors destroying agricultural livelihoods. At the same time, the local fishing industries themselves are impacted by urbanisation and the rural exodus, as well as the climate crisis. These fishing communities are thus simultaneously arrival and transit points for migrants from internal rural areas, as well as some neighbouring countries, and departure points for some seeking to reach a hoped-for better life in Europe.

9. The UNHCR and UNICEF (2014: 22) consider unaccompanied minors to be any person under the age of eighteen who is outside his or her country of origin or habitual residence and who has been separated from both parents and other relatives and who is not being cared for by an adult who, by law or custom, is responsible for doing so.

METHODS

1. RESEARCH TEAM

The University of Bologna (UNIBO) coordinated the research element of the project. The UNIBO interdisciplinary research team draws on expertise from four different departments:

- Sociology and Business Law
- Agricultural and Food Sciences
- History and Cultures
- Political and Social Sciences

Working across disciplinary boundaries is important for furthering knowledge and reciprocal awareness. Studies have also shown that interdisciplinary research can be more accountable and innovative (Barry et al., 2008). Each discipline has its own specific methodological approach, with some cross-over. The research was then both interdependent and distinct at the same time.

The research adopted an **action research methodology** upholding the belief that it is important to conduct research 'by, with and for people, rather than research on people' (Reason & McArdle, 2004:1). Action research has been defined as "the study of a social situation with a view to improving the quality of action within it" (Elliott, 1991:69). Within this approach, monitoring and evaluation run beside research activities. We worked in collaboration with ClimateOfChange project partners from the non-governmental organisations (NGOs) and statutory sectors across Europe and our associates in the Global South to draw upon their expertise on the ground. Innovative NGO-Academic partnership can help bridge knowledge divides and lead to impactful, relevant research (Shucksmith, 2016).

2. THE IMPACT OF COVID-19 ON RESEARCH ACTIVITIES

The research was conducted during the global COVID-19 pandemic and thus for obvious reasons had to be significantly redesigned. Instead of in-person fieldwork trips, the research team was forced to fully rethink the methodology, and instead conduct research remotely in 3 of the selected countries. It was only possible for UNIBO to visit Senegal.

In addition, owing to the significant deterioration of the security situation in Ethiopia during the course of 2020, it was no longer feasible or safe to conduct research in the country. As a result, the decision was made in 2021 to focus upon Kenya instead, where a team of WeWorld is located.

3. PREPARING THE FIELD VISITS: DESK ANALYSIS

The pre-field visit activities were carried out between June to October 2020. These activities helped the development of the initial stages of the project and included a comprehensive scientific

literature review (including a general bibliography, legal briefing with definition and legal framework), key remote interviews, visual analysis/critical discourse analysis and analysis of secondary data.

3.1 LITERATURE REVIEW

A mixed method approach was adopted by drawing upon and integrating the desk literature review and interviews with key stakeholders to widen the scope of the empirical data and provide a richer resource for analysis. The existing literature was mapped by considering the different perspectives in the sociological, agricultural, geographical and legal fields and sourced using ProQuest database, Google Scholar and specific field-related literature and doctrines.

An intersectional approach was adopted throughout. Analysis of grey literature, including the main documents issued by relevant actors in the field, i.e. IOM, the UN and NGOs, was also conducted alongside relevant secondary data from official sources (international reports, databases, etc.). Results from this part of the research are summarised in section 6 below.

3.2 REMOTE RESEARCH

Interviews were conducted remotely with a range of key actors in each case study country. In June 2020, the UNIBO team carried out desk-based research to identify suitable research participants. Whilst the aim of the research project was to gain input from those whose lives are directly impacted by climate change, such interviewees are extremely difficult to access in person, yet alone remotely. Therefore, the research focused on key professionals to give an overview of the issues facing people living in the case study countries to identify potential patterns, as well as trends and differences in each in relation to climate change, migration and their interaction. The interviews also functioned as a scoping study to identify organisations and locations of interest that would also be feasible for research on the ground.

Participants were selected either via snowball technique from pre-existing contacts, or contacts from project partners, with particular attention to those working on climate change and/or migration in each case study country. However, the majority were sourced through online research processes and cold-calling the authors of relevant research reports, media outputs or NGO projects. Cold-calling can suffer from selection bias since particular groups of people are more prone to respond to direct mailing, like public figures (for example local authorities, government officials) and, equally, it is not possible to reach more vulnerable, at-risk participants as they would not have the technology or language skills to participate.

From mid-June 2020 to September 2020, the research team conducted **a total of 35 (3 general + 32 country-specific) remote interviews with key**

stakeholders from a range of organisations (including local and international non-governmental organisations (NGOs), intergovernmental organisations (IGOs), research institutions and statutory bodies working on climate change and/or migration (see Table 1 for an overview and Appendix I for the complete list). Interviews were conducted in line with the University of Bologna ethics guidelines¹⁰ via a number of platforms (MS Teams, Zoom, Skype, WhatsApp). All interviewees were informed as to the scope and purposes of the project and were given the opportunity to remain anonymous. Many, particularly in Cambodia, given the autocratic government, chose to do so. Pursuant to art. 13 of Regulation (EU) 2016/679 (General Data Protection Regulation), all personal data is held by UNIBO and processed in compliance with the requirements of Regulation (EU) 2016/679 (General Data Protection Regulation) and Decree 196 dated 30 June 2003 and subsequent amendments and additions (Data Protection Code).

Interviews were semi-structured, involving primarily open-ended questions and were tailored to the specific roles of the figures interviewed but all focused on four macro-topics: climate change, migration, policies and media. Interviews were conducted in English, Spanish, French and Italian, on the basis of interviewees' preferences.

Thematic analysis was conducted, and findings shared between researchers and then revised by another researcher so as to ensure consistency in interpretation and analysis. The research team engaged regularly in peer debriefing to question and reflect on the process and emerging key issues.

10. <https://www.unibo.it/en/university/who-we-are/ethical-code-of-behaviour> (last access: 01/09/2020)

TABLE 1 INTERVIEWS PER COUNTRY AND TYPE OF RESPONDENTS

	Research institution	Non Governmental Organisations (NGO)	Inter-Governmental Organisations (IGO)	Other	Total
General context	1	-	2	-	3
Cambodia	1	3	2	4	10
Guatemala	2	4	2	-	8
Senegal	1	4	2	-	7



4. FIELDWORK IN THE FOUR CASE STUDIES

Due to the COVID-19 pandemic and ensuing travel restrictions, UNIBO could only conduct research in person in Senegal. In the other three countries, fieldwork was conducted remotely:

In Cambodia and Guatemala, the research was subcontracted to specialised companies via tender; and in Kenya it was conducted by the local WeWorld team.

4.1 FOCUS GROUPS

A minimum of two focus groups were held in each country: one in a urban area and one in a rural area (in Senegal we conducted two in each location, four in total). Focus groups included a mixture of people from a range of ages, socio-economic backgrounds and gender. Focus groups are useful tools for the understanding of motivations that underlie perceptions and opinions on environmental change, as well as to identify, through discussion and comparison, the conditions and actions that could lead to migration strategies (Bloor et al, 2001). The group nature of this approach has been shown to enable participants to open up more, as the discussion focuses upon general and non-personal issues. These discussions were mainly aimed at identifying any key economic, environmental and social drivers of migration; and to draw out individual strategies, perceptions and choices of families and communities; to consider the economic, environmental and social impacts of migration on agricultural and rural areas; explore the concept of climate and environmental (in)justice, and finally to examine the false binary between voluntary/forced migration.

The focus group setting can enable participants to have greater control over the themes discussed than in the interview setting, as well as provide a medium through which to elicit their views on particular topics (Gunaratnam, 2013). It is also appropriate as a timely method within a short time period in a 'non-threatening environment' (Krueger, 1994). Additionally, within the focus group space, to enable participants to feel comfortable to talk, we included some "exercises" (**activity-oriented questions**) to accompany questions, such as choosing photographs related to migration and climate change and brainstorming games (Colucci, 2007) - see Appendix II. Such activities provide for different ways to gather information and are beneficial, for instance, for more reflective thoughts not overly framed by researchers' questions. They may help more introverted people to interact within the group. Focus groups involved interpreters where appropriate.



Focus group on Guet Ndar beach

4.2 IN-DEPTH INTERVIEWS WITH KEY INFORMANTS

Since different methodologies privilege different portrayals of environmental change risks and migration dynamics, we highlight how plural methodological approaches can capture a broader range of perspectives. Focus groups discussion were then enhanced with **between 15 to 30 in-depth personal interviews per country**. We selected interviewees both from rural areas and urban cities, from those who have faced environmental challenges (either slow-onset environmental change or rapid-onset disasters) in their everyday life.

We used semi-structured (see Appendix III for more details) interview questions that allow participants to explain in greater detail the reasons for their migration decision and/or their adaptation strategies, and how environmental and other factors influenced these decisions. Short questionnaires with demographic and socio-economic information were also collected from individuals interviewed. Interpreters were used where appropriate.

4.3 VISUAL STORYTELLING

A central component of this research is to raise awareness of contexts and situations across the different layers of society. As such, the researchers collected audio-visual material to fuel the campaigning and advocacy activities of the project for the purpose of raising awareness of issues relating to the climate crisis and mobility. The case studies proposed focus on giving a human face to data and evidence (Gemenne, 2011;

Manzo 2010). Visual storytelling can help overcome narratives around the climate crisis that can be too abstract and difficult to visualise and instead draw attention to the devastating impact on lives and livelihoods. The general aim was to provide personal stories, co-constructed by migrants themselves, as well as activists and academics, to which people can connect.

4.4 CLIMATE DIARIES

The COVID-19 situation also opened up new creative possibilities to conduct research through visual methods and remote coordination via WhatsApp.

Via our methodology of 'climate diaries' (Giacomelli and Walker, 2021), we asked participants to share photos and perceptions of the climate crisis over a period of time through a WhatsApp group.

Every week we asked participants to answer visually with a photo taken with their smartphones followed by a small explanation of the photo and why they chose to share it. Each participant could share up to 10 pictures in response to each question.

The questions were the following:

- 1. Introduction:** Who are you? Visually introduce yourself (selfie or whatever you think represents you).
- 2. First week:** What is climate change for you? How is climate change affecting your life?
- 3. Second week:** Picture places in your city/village that changed in the last 10 years due to climate change? Participants could share, for example, if they have any, old pictures that show the differences between past and present in the environment.
- 4. Third week:** How do you cope with changes in the environment?
- 5. Fourth week (mobility/migration):** What is mobility/migration for you? How is the mobility/mobility of your relative affecting your life/that of your family?



4.5 HOUSEHOLD SURVEYS

As an interdisciplinary research project, qualitative data was enhanced by a quantitative approach which can capture larger responses in a set area.

A new project specific household survey was designed on the basis of the desk analysis and remote interviews to collect both migration and environmental data and analyse the connection between them.

The survey uses the broad definition of **household** provided by FAO: “a household is based on the arrangements made by persons, individually or in groups, to provide themselves with food or other essentials for living. The persons in the group may pool their incomes and assets and have a common budget to a greater or lesser extent”.

The two other operational definitions of the two key terms for the study are migration and climate change. Regarding **migration** we consider:

- households that moved to the sampled area from outside in the previous 36 months; or
- A current or previous household member moved from the sampled area to outside for a minimum of one month in the last 36 months.

For the purposes of this study, **impacts of climate change** is defined as:

- Partial or total destruction of housing where homes are blown down by strong winds, washed away by flooding, or fires from natural causes (e.g., lightning strike, wildfires);
- Partial or total destruction of property (e.g., agricultural land, crops, and/or land/soil damage) caused by adverse weather conditions (i.e., flooding, drought, wildfires, and/or storms);
- Poor crop yields caused by weather conditions; and
- Negative impact to farming/fishing activities caused by climate conditions (e.g., migration patterns of fish resulting in lower catches than normal)

The aim of the survey was to analyse different aspects of rural households in the selected case study areas of Cambodia, Guatemala, and Kenya and the strategies they adopt to manage the impacts of climate change. In particular, we considered overall livelihood strategies, migration patterns by family members, changes in agricultural resources allocation, gender/generational roles and decision making before and after migration, and allocation of remittances to better understanding feedback processes between livelihoods and mobility patterns both within each case study and across case studies, helping to draw general lessons.

The questionnaire was composed of a general backbone that was identical for all case studies so to ensure comparability, with some specific terminology and questions adapted to each specific local context.

The sample frame was devised from the results of the desk analysis. The survey design method requires sufficient numbers of “recent migrants” (along with non-migrants) (Bilsborrow et al 2009). Two strategies for sampling were utilised: purposive sampling and probability proportional to size (PPS) sampling, depending on the context of activity.

Since the case studies focus on local context-specific situations, the sample remained between 200 and 400 units:

- 200-400 participants
- General population, male and female, from 18 to 65 years old, resident in the selected region
- Half hour questionnaire

5. CASE STUDIES IN DETAIL

5.1 SENEGAL

The University of Bologna research team visited Senegal in May 2021. The team worked with two Senegalese facilitators, Modou Mbaye in Saint Louis, and Mamadou Diaw in Dakar, who acted as cultural and linguistic bridges. This also allowed for continual reflection on the research findings and some particularities of Senegalese culture, expressions in the Wolof language, and understandings of the environment itself.

Such issues do not necessarily reflect Eurocentric perspectives and this reflexivity was vital to enhancing understanding:

- **A one-month climate diary:** 30 participants (15 from rural areas - St. Louis, 15 from urban areas - Dakar)
- **Focus groups:** 4 groups (5-10 people each, gender and age diverse): 2 in Dakar 2 in Saint Louis
- **In-depth interviews:** 35



A one-month climate diary

30 participants



4 Focus groups

of 5-10 people each



35 In-depth interviews

5.2 GUATEMALA

Fieldwork in Guatemala was outsourced to two specialised companies: Kantar Mercaplan for the household survey; SocialLab for climate diaries, focus groups and in-depth interviews.

- **A one-month climate diary:** 30 participants (15 from rural areas, 15 from urban areas).
- **Focus groups:** 4 groups (5-10 people each, gender and age diverse), 2 in an urban area (Guatemala City) and 2 from a rural area (1 in Chuicullil Village, Nahualá, Sololá and 1 in Vásquez Village, Totonicapán).
- **In-depth interviews:** 11 participants.
- **Household survey:** 400 households, male and female, from 18 to 65 years old, representative of the rural population of the province of Totonicapán having experienced climate change and/or having one migrant member within the HH.



A one-month climate diary

30 participants



4 Focus groups

of 5-10 people each



11 In-depth interviews



400 household surveys

5.3 CAMBODIA

Fieldwork in Cambodia was outsourced to two specialised companies: Angkor research for the household survey; RUPP (Royal University of Phnom Penh) for climate diaries, focus groups and in-depth interviews.

- **A one-month climate diary:** 30 participants (Battambang).
- **Focus groups:** 2 groups (5-10 people each, gender and age diverse), 1 in Battambang, 1 in Phnom Penh
- **In-depth interviews:** 16 participants (4 in Phnom Penh and 12 in Battambang province).
- **Household survey:** 200 households, male and female, from 18 to 65 years old, representative of the rural population of Battambang having one migrant member within the HH.



A one-month climate diary

30 participants



1 Focus group

of 5-10 people each



12 In-depth interviews



250 household surveys

5.4 KENYA

Fieldwork was outsourced to WeWorld and its local team.

- **A one-month climate diary:** 30 participants (Merti and Isiolo).
- **Focus groups:** 2 groups (7 people each, gender and age diverse), 1 in Merti, 1 in Isiolo
- **In-depth interviews:** 10 participants (Merti and Isiolo)
- **Household survey:** 200 households, male and female, from 18 to 65 years old, representative of the rural population of Merti having experienced climate change and/or having one migrant member within the HH.



A one-month climate diary

30 participants



2 Focus groups

of 7 people each



10 In-depth interviews



200 household surveys

TABLE 2 OVERVIEW OF FIELD WORK ACTIVITIES

Country		Qualitative			Quantitative
		Focus Groups	Interviews	Climate Diaries	Household survey
Out sourced	Cambodia	2 (x5/7pp)	15	30	250
	Guatemala	2 (x5/7pp)	10	30	400
	Kenya	2 (x5/7pp)	10	30	200
UniBo	Senegal	2 (x5/7pp)	35	30	NA



A fisherman try to fish near Tonle Sap Lake, Cambodia @RounRy

6. CAPTURING THE COMPLEXITIES OF MIGRATION

The household survey and questionnaire design were based upon a framework deriving from desk analysis. The focus was predominantly rural communities, owing to the case study locations. However, we are cognizant the climate crisis also deeply affects urban areas and mobility patterns in complex and multiple ways. Several scholars contend the interaction between environmental degradation and migration is complex and difficult to quantify and separate from other causes (economical, political, social ones) especially when gradual changes are considered compared to climate shocks (Bardsley et al., 2010; Cattaneo et al., 2019).

“ *There are as many reasons for migrating as there are migrants*”

In scientific literature, the forces that engender and perpetuate migration flows are defined as ‘migration drivers’. Some of these drivers may be external to prospective migrants, involving narratives of migration itself, structural and institutional factors, while others are connected to people’s agency, their social experiences, their perspectives and their ability to improve their life conditions or cope with life’s challenges (FAO et al., 2018). They act in different directions as they can either facilitate, limit, prevent or trigger migration decisions. Migration drivers increase or decrease the desirability of the act of migration, the likelihood of particular migration patterns, and the attractiveness of destinations. Sometimes the word ‘determinants’ is used instead of ‘drivers’ suggesting a stronger link, sometimes even causal, between structural factors and migration. However, due to the intrinsic role of human agency in the decisions regarding migration this report follows scholars (Carling and Talleraas 2016; de Haas 2011 among others) who prefer the term

‘driver’ of migration as “structural elements that enable and constrain the exercise of agency by social actors” and they work by “[...] making certain decisions, routes or destinations more likely and bringing them within the orbit of people’s capabilities” (Van Hear et al. 2018: 928).

Scientists and experts have identified a number of fundamental dimensions of migration drivers including economic, political, social, cultural, demographic, and ecological factors (for comprehensive reviews see e.g. Ghatak et al. 1996; Hagen-Zanker 2008; King 2012; Massey et al. 1993).

Within each dimension, drivers can be divided in three groups according to their level of aggregation and proximity in time and space to individuals:

- Macro factors: the (dis)incentive to migrate is created by the differentials in conditions between areas of origin and potential destinations like productivity, employment opportunities, quality of services (such as education, health), access to markets (infrastructure), symbolic factors and also impacts of climate-related events.
- Meso factors: these are conditioning factors, closer in time and space, that can either constrain or facilitate migration. They include the distance between the origin and the destination place, the costs and the security of the journey, social networks, the presence of legal constraints or, viceversa, bilateral agreements that regulate migration patterns.
- Micro factors: personal factors like age, gender, education, composition of household, perceptions and so on. Individual behaviours and decisions.

TABLE 3 MIGRATION DIRVERS

Dimension\ Level	Micro	Meso	Macro
Demographics	Household composition Gender Age	Local population dynamics Ethnic groups	Macro population Dynamics Historical migration patterns
Economic	Individual behaviour and decisions Livelihood Food security Individual income Access to credit and remittances Poverty level	Job market access Agricultural productivity Market demand for products Infrastructures and services	Post-colonial relationships National income (GDP)
Socio-Cultural	Personal Aspiration Education and skills Ethnicity Language	Narrative Cultural norms Migrant communities and networks Gender relationships Infrastructures and services	Cultural similarities between countries
Political and Legal framework	Local (informal) authorities and entities	National and local legislations Conflicts and violence Civil and Political right Governance Infrastructures and services	International/regional treats International/regional relationships International/regional Human right protection
Environment	Adaptive capacity individual/ village Perception of risk	Climate shocks Soil erosion Salinification Rainfall increased variability	Global climate change Global environmental degradation Environmental justice

In this framework environmental and climate change influences the decision to migrate at all three levels – macro, meso and micro. For example, environmental degradation in the place of origin may amplify the differentials in opportunities (macro factors) with the destination area, boosting incentives to migrate; the establishment of institutions to deal with environmental crises or the creation of new networks in destination countries can modify the intermediate factors; the impact of environmental hazardous events and the perception of risk of impacts of climate change can influence the individual propensity to migrate. The extent to which climate/environmental change is a cause of migration varies in a continuum from not being significant at all to being the overwhelming cause of migration.

Finally, agriculture is one of the key links between environment, climate change and migration (see Falco et al, 2018). While the impacts of climate change on agriculture and food security are relatively well established, the cascading effects of climate change on migration and its consequences for agriculture have not been adequately assessed and addressed. The reasons behind the idea that agriculture is one of the most important channels driving the relationship between climate change and migration is related to the fact that (i) this sector is affected by weather and climate shocks more than almost any other sector in the economy and (ii) it is the main source of income and employment in rural areas of developing countries, where most migrants come from (Falco et al., 2018). The economic vulnerability of agriculture is related to a number of interacting elements, including farmers' decisions and skills, ageing in rural areas, weather conditions, international prices of agricultural commodities and inputs, production and consumption patterns, trade and international exchange. Agriculture is also at the core of environmental concerns over the management of natural resources – land degradation, water scarcity, deforestation, and the threat to biodiversity (FAO et. al., 2018).

Climate change impacts agricultural productivity and rural livelihoods and intensifies rural poverty and food insecurity. Moreover, the vulnerability of people working in the agriculture sector is increased by both sudden-onset events and slow-onset processes. Most of the world's poor, vulnerable and food-insecure live in rural areas and depend heavily on agricultural production, fisheries and forest-based livelihoods for their subsistence so at the individual level vulnerability is connected to the lack of access to natural resources necessary for food and agricultural production, types of crops, and access to markets. Usually, in the literature the causal chain that connects climate change and migration considers how climate change negatively affects soil quality and rainfall patterns, which in turn adversely affect agriculture and livelihood in rural areas. Indeed, several scholars identify rural poverty, food insecurity, lack of employment opportunities, and the depletion of natural resources as key drivers of migration from rural areas (Maretti et al., 2019). Sudden onset events connected to climate change tend to have direct and immediate impact on migration through the production of livelihood losses. Slow-onset events interact with vulnerabilities and socio-economic factors to influence migration decisions exacerbating poverty, food insecurity, lack of employment opportunities, limited access to social protection and the depletion of natural resources.

Migration in rural areas can assume different patterns (rural/urban, rural/rural, national/international) where internal migration is one of the coping strategies and, in particular, seasonal migration can be an important risk-management strategy, often used by farming households to diversify income sources and hedge against income uncertainty and food insecurity¹¹. When coercive factors come into play, migration becomes less voluntary and as these factors increase, so does the vulnerability of rural livelihoods.

Migration as an adaptation strategy to climate change, presents both opportunities and challenges (FAO, 2017). On the one hand, migration can enhance the capacity of households to cope with climate change, for example through the contribution of remittances, or via the diversification of income sources. In these cases, migration can mitigate the negative impact of climate change. However, this type of migration is common among the poor but not necessarily among the poorest who may lack the resources to move.

On the other, migration can also exacerbate vulnerability to climate risks, for example when it increases the pressure on (scarce) natural resources (Falco et al., 2018). Inclusive and sustainable agriculture and rural development are foremost important in mitigating climate change impacts and to decrease the vulnerability of people. As a consequence, governments have a key role in promoting better conditions for those most vulnerable to the impacts of the climate crisis.

11. As for example, traditionally used by pastorals and nomads in Senegal and Ethiopia.

SENEGAL

CASE STUDY 1



SENEGAL

CASE STUDY 1

Who is the climate migrant? And how can we discuss the complex nexus between the climate crisis and migration in a manner that is productive and beneficial to those whose lives and livelihoods are most at risk from the climate crisis? These are some of the questions that this report grapples with and that have been the focus of much discussion throughout the EU project “**End Climate Change, Start Climate of Change**” (#ClimateOfChange), co-funded by the European Union’s Development Education and Awareness Raising Programme (DEAR), within which the research is based. Questions that, sadly, as with all things related to discussions on migration, are deeply political in their nature. In seeking to answer them, we draw upon empirical research from four case study countries: Cambodia, Guatemala, Kenya and Senegal. **This section focuses upon Senegal.** Research was conducted by the interdisciplinary research team based at the University of Bologna, drawing upon combined sociological, agricultural and food systems, human-geographical and legal perspectives, together with partner organisations on the ground where we were unable ourselves to visit the case study countries due to the COVID-19 pandemic.

Senegal is highly environmentally fragile and faces concomitant sea level rise, coastal erosion, soil salinization, maritime storms and depletion of fish

stocks and biodiversity. Located in the tropical belt, natural disasters are increasing in frequency and intensity in Senegal. The country has a high incidence of climate-sensitive economic activities, including farming and fishing. This is due to the high population density and the concentration of almost all economic activities in coastal areas. The climate crisis is more likely to have significant negative impacts when combined with lack of adaptive capacity. Additionally, migration patterns are geographically and historically specific. The case study areas (Dakar and St. Louis) were purposefully selected to capture some of the complexities of mobilities and the interaction of the climate crisis with historical mobility patterns. Rural migrants from Senegal’s internal regions migrate to these urban coastal areas to work, often in the fishing industry to finance their agricultural activities. Once seasonal, these historical mobility patterns are shifting through the combined impacts of the climate crisis and socio-economic structural factors destroying agricultural livelihoods. At the same time, the local fishing industries themselves are impacted by urbanisation and the rural exodus, as well as the climate crisis. These fishing communities are thus simultaneously arrival and transit points for migrants from internal rural areas, as well as some neighbouring countries, and departure points for some seeking to reach a hoped-for better life in Europe.



Ameth Sène Diagne visiting again his former village flooded by the sea in Languè De Barbarie (Saint-Louis) ©ElenaGiacomelli

7. COUNTRY OVERVIEW

Region	Western Sub-Saharan Africa
Population	16.7 million ¹²
Male	48.2%
Female	51.2%
Human Development Index	0.514 (rank: 166/189)
Ethnic Groups ¹³	Wolof 37.1%, Pular 26.2%, Serer 17%, Mandinka 5.6%, Jola 4.5%, Soninke 1.4%, other 8.3% (<i>includes Europeans and persons of Lebanese descent</i>)
Urban population (% of total population)	2.8
Poverty rate	46,7%
Child marriage by age 18, 2005-2019	29%
Gender parity index, total net enrolment rate, primary education, 2010-2020	1.14
Total net enrolment rate, primary education 2010-2020	74%

Senegal borders the Atlantic Ocean on the western most point of the African continent. Although most of the country has a tropical climate, the country's northern regions (located in the Sahel) are arid. Its climate has two distinct seasons: a dry season from roughly October to May and a rainy season from June to September. Whilst Senegal has enjoyed a strong economic performance and a steady growth over recent years, the population's living standards are still very low. The country remains affected by important disparities

between regions, some of them being severely marginalised and facing hardships in relation to population, agriculture and employment management. Despite a growth rate of over 7% since 2017, and an optimistic forecast, particularly with oil and gas production expected in 2022, Senegal is ranked 168 in the Human Development Index¹⁶, and the poverty rate is 46.7%¹⁷. The Senegalese population is very young: more than 60% of the population is under 25 years old.

12. <https://www.worldbank.org/en/country/senegal/overview#1>

13. CIA database <https://www.cia.gov/the-world-factbook/countries/senegal/#people-and-society>

14. <https://www.unfpa.org/data/world-population/SN>

15. <https://www.unfpa.org/data/world-population/SN>

16. <http://hdr.undp.org/en/countries/profiles/SEN>.

17. <http://hdr.undp.org/en/countries/profiles/SEN> (Population living below income poverty line, national poverty line (%)).

Senegal is one of Africa's most stable countries¹⁸, with three major peaceful political transitions since independence from France in 1960. Senegal's present-day links with its former colonial power remain strong.

France is Senegal's largest foreign investor. Senegal is a member of the West African Monetary and Economic Union. The union has a single France-backed currency, the CFA franc, which is currently pegged to the euro.

BOX 1: SUMMARY OF THE CLIMATE CRISIS IN SENEGAL

Slow-onset environmental change

Sea level rise (SLR) is causing saltwater intrusion, coastal erosion and salinification in the Saint Louis (Gandiol) and Djiifer (fisherman village delta of the Salum river) and the Fatick areas, as well as peri-urban areas around Dakar.

Deforestation and overexploitation of land resulting in soil degradation and erosion is problematic in the Louga region.

Droughts in Senegal are concentrated mostly in the arid and semi-arid Sahelian regions of the country, located in northern and central Senegal.

Sudden-onset hazard

Both urban and rural areas are vulnerable to floods; however, the most at risk areas are those in and around Dakar, Saint Louis, Matam, Kaolack, Thies, Diourbel, Kolda, Kaffrine, and Tambacounda. Floods are the result of river overflows - a combination of heavy rains and poorly planned drainage systems and storm surges. Rapid urbanisation has further reduced infiltration and exacerbated the impacts of floods (Sy et al., 2020).

18. From the World Bank overview: <https://www.worldbank.org/en/country/senegal/overview#:~:text=Senegal%20is%20one%20of%20the,year%20term%20in%20February%202019>



7.1 STRATEGIES FOR COPING WITH ENVIRONMENTAL AND CLIMATE CHANGE

In recent years Senegal has scaled up disaster risk management efforts and has included it as one of the sub-components of **Senegal's Poverty Reduction Strategy**¹⁹. However, public policies for managing the effects of climate variability both in terms of environmental protection and household support are not always perceived to be consistent. In the first place, "management of climate change is like a flash" (African Movement of Working Children and Youth - AMWCY, remote interview) and thus essentially based on **urgency and emergency interventions** rather than on prevention measures. Moreover, while the Government's approach

to disaster risk is still characterised by a multitude of specialised agencies, each focused on a specific type of risk and/or a target population, a national strategy based on an integrated approach is missing. Secondly, even though an increasing management capacity with a long-term perspective is visible in the progressive adoption of **'green measures'** for investing in the environment and on renewable sources of energy (especially wind and solar), the positive impact of these measures is limited to big cities while smaller cities and poor regions do not have the opportunity to implement the strategies well.

BOX 2: SUSTAINABLE DEVELOPMENT GOALS (SDGS)

The Sustainable Development Goals (SDGs), also known as the Global Goals, form the core of the 2030 Agenda and were adopted by all United Nations Member States in 2015 as a universal call to action to achieve accelerated, high, inclusive, broad-based, sustainable economic growth, social-economic transformation and development by 2030. The 2030 Agenda for Sustainable Development also acknowledges the importance of the African Union Agenda 2063 and considers it an integral part of it. According to the Sustainable Development Goals Dashboard, Senegal ranks 126 out of 165 in the Sustainable Development Goals (SDG) Index. The country has achieved SDG 13 (Climate Action) measured through CO2 emissions, and SDG 12 Responsible Consumption and Production. It is facing major challenges in SDG 14 Life below Water, in relation to biodiversity loss and ocean health; SDG 5 gender equality, particularly in relation to education disparities; SDG 6 clean water and sanitation; and SDG 3 Good health and wellbeing, particularly in relation to deaths attributed to air and ambient pollution. Significant challenges remain in relation to SDG 15 life on land, particularly in relation to permanent deforestation.

19. <https://www.imf.org/en/Publications/CR/Issues/2016/12/31/Senegal-Poverty-Reduction-Strategy-Paper-40739>

7.2 NATIONAL MIGRATION POLICY

The right to move and to settle abroad is guaranteed by art. 14 of the Senegalese Constitution according to which “Tous les citoyens de la République ont le droit de se déplacer et de s’établir librement aussi bien sur toute l’étendue du territoire national qu’à l’étranger”²⁰. Whilst there may not be a specific global emigration or diaspora policy framework in Senegal, there have been numerous laws, policies, and actions, adopted by the government since the 1980s that attempt to

frame the migration process. Human trafficking and organized clandestine migration are penalized by the law. Within the context of the Convention against Transnational Organised Crime, in 2003 Senegal ratified the Palermo protocol to prevent, suppress and punish trafficking in human beings, and consequently adopted Law no. 02-2005, which seeks to protect victims of trafficking and equivalent practices.

BOX 3: THE (POST-) COTONOU AGREEMENT

The relations between the EU and Senegal are founded upon the Cotonou Agreement adopted in 2000 for a 20-year period between 78 African, Caribbean and Pacific (ACP) Group of States and the European Community. It entered into force in 2003 and was subsequently revised in 2005 and 2010. The Cotonou Partnership Agreement is based on three complementary pillars: development cooperation, economic and trade cooperation, and the political dimension. The CPA has a strong mandate for political dialogue, with a focus on fostering mutual understanding, facilitating consultations, and strengthening cooperation between the parties. The CPA provides for flexible discussions to be held at national, regional or continental levels, within or outside the institutional framework, and includes participation from the Joint Parliamentary Assembly, central government agencies, and civil society organisations. The Cotonou Agreement explicitly leaves it up to the ACP countries to decide the level and procedures of the EPA trade negotiations, taking into account the regional integration process. On 3 December 2020, the EU and the Organisation of African, Caribbean and Pacific States reached a political deal on a new agreement that succeeds the CPA with the objective of adapting the partnership to frameworks like the Sustainable Development Goals and the Paris Accord. Marking the end of the negotiations, the ‘post-Cotonou’ agreement was initialled, and the text was released on 15 April 2021. Once it enters into force, the new partnership agreement will serve as the new legal framework for EU relations with 79 African, Caribbean and Pacific (ACP) countries. The agreement aims to strengthen the capacity of the EU and the ACP countries to address global challenges, including human rights’ protection; sustainable economic growth and development; climate change; human and social development; peace and security; and migration and mobility.

20. “All citizens of the Republic have the right to move and settle freely throughout the national territory and abroad”. Translation of the authors

Senegal is increasingly working with regional and international entities in relation to migration. Several bilateral agreements containing provisions on labour migration have been concluded with Morocco, Mauritania, Gabon and Kuwait. With regard to the EU and its Member States, the Cotonou Agreement (See Box 1), signed in 2000, is a key document. This will be soon replaced by the Post-Cotonou Agreement, which binds the EU and the African leaders of the countries most concerned to reinforce political cooperation on migration. Senegalese migrant workers in EU Member states fall under the general immigration policy of the EU that was most recently reformed by the Lisbon Treaty. The previous system, based on bilateral agreements between the EU Member States and third countries for the granting of temporary and long-term work permits, has been succeeded by introducing common rules applicable in all the EU Member States (De Bruycker, 2016). Short-term entry permits are now also the responsibility of the EU, who defines the conditions of entry and residence of third-country nationals entering and residing legally in one of its Member States, including family reunification. Current Union legislation (Regulation (EU) 2019/1155) regulates the procedures and conditions for issuing the so-called Schengen visa (short-term visas up to three months over a period of six months) and sets a common list of countries whose na-

tionals are required to have a visa before entering EU Member States (Regulation (EU) 2018/1806). Similarly, Directive 2014/36/EU regulates the conditions of entry and residence of third-country nationals for the purpose of employment as seasonal workers, as well as their set of rights. However, the decision on access to the territory remains an expression of State sovereignty, and Member States retain the right to determine admission quotas for third country nationals seeking employment, including seasonal work (Directive 2014/36/EU, article 7) and the granting of long-term visas. With regards to the Schengen visa, Senegal is currently included in the list of countries whose nationals are required to be in possession of a visa when crossing the external borders of an EU Member State (Annex I, Regulation 2018/1806). Under Article 13 of the Cotonou Agreement still in force, Senegal shall accept the return of and readmission of any of its nationals who are illegally present on the territory of an EU Member State. Since bilateral agreements governing specific obligations for the readmission and return of irregular migrants are allowed, Senegal has signed agreements with France (2009), Italy (2010), and Spain (2021) that include clauses on the readmission of irregular migrants and commitments for an active cooperation on border management with the EU.



Mamadou Khary Seck and his family staying in Khyar Yalla after the destruction of their house along the coast ©ElenaGiacomelli

8. METHODS

Information in this chapter is taken from a combination of desk analysis and interviews conducted remotely via video calling systems (Skype, Zoom) in June-July 2021 with key stakeholders working on migration and/ or environment in Senegal. This is integrated with empirical data from fieldwork interviews conducted by the University of Bologna research team in May 2021 with local people affected by the climate crisis in Dakar and Saint Louis to examine the lived experiences of its impacts. In Senegal, the UNIBO research team worked with two Senegalese facilitators, Modou Mbaye in Saint Louis and Mamadou Diaw in Dakar, who acted as cultural and linguistic bridges. This also allowed for continual reflection on the research findings and some particularities of Senegalese culture, expressions in the Wolof language, and understandings of the environment itself. Such issues do not necessarily reflect Eurocentric perspectives and this reflexivity was vital to enhancing understanding.



A one-month climate diary

30 participants



4 Focus groups

of 5-10 people each



35 In-depth interviews

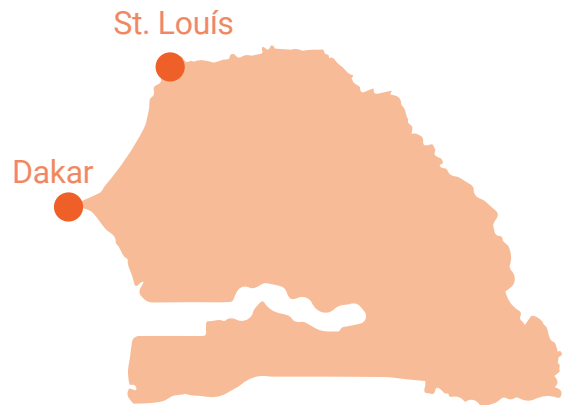


35 Visual story-telling

1. **A one-month climate diary** (see Giacomelli and Walker, 2021): 30 participants (15 from rural areas - St. Louis, 15 from Dakar)
2. **Focus groups**: 4 groups (5-10 people each, gender and age diverse): 2 in Dakar 2 in Saint Louis
3. **In-depth interviews**: 35
4. **Visual story-telling**: 35

8.1 FOCUS: DAKAR AND SAINT LOUIS

Dakar and St. Louis, two coastal cities in Senegal, were selected as case study areas as they are significantly affected by the climate crisis, in particular, **coastal erosion, driven by rising sea levels and rapid urbanisation**. In Dakar, the coastal communities of Rufisque, Thiaroye-sur-mer, Dalifort and Hann Bay were selected owing to their high vulnerability to the climate crisis and the diverse mobilities at play in these sites. Saint-Louis was also selected for its extreme fragility to the climate crisis. In 2008, the UN identified Saint-Louis as “the city most threatened by rising sea levels in the whole of Africa” (BBC 2008).



Senegal is characterised by mass rural and internal migration towards Dakar. Of all Senegalese people, 14.6 per cent are internal migrants, and only 1.2 per cent are international migrants. The main emigration destinations are Europe (hosting 44.5% of international migrants), West Africa (27.5%) and Central Africa (11.5%) (ANSD, 2014)²¹.

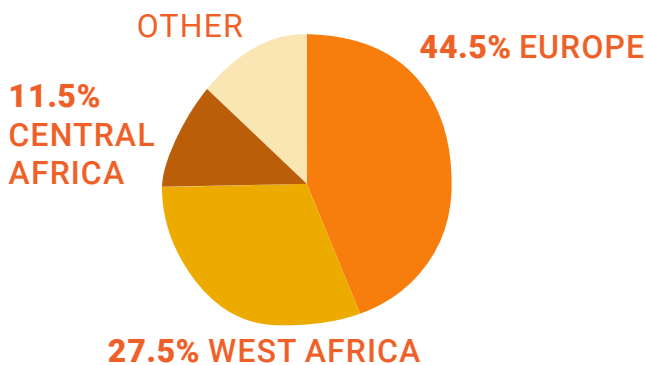
According to the most recent population census, most international migration departures occur from urban areas; with 30.3% from Dakar (Ibid.).

30% DEPARTURES FROM DAKAR

15% OF INTERNAL MIGRANTS

1% OF INTERNATIONAL MIGRANTS

of these



Child migration as an adaptation strategy for families in rural areas is common practice, rooted in a long history of migration, the gender divide is roughly 50/50.²²

Mobility has long been a mechanism for Senegalese to manage climate vulnerability, including seasonal migration from rural to fishing sectors to diversify livelihood, as well as nomadic pastoralism. However, the climate crisis is affecting these historical mobility patterns. The rural to urban seasonal migration patterns have become a large rural exodus in Senegal. This is the result of changes in rainfall patterns, desertification and lack of investment in new technologies destroying agricultural livelihoods in rural areas where land degradation is increasing.

21. <http://www.ansd.sn/>

22. IOM/ACP Observatory on Migration (2012) https://publications.iom.int/system/files/pdf/case_of_senegal_en.pdf

Rural migrants from Senegal's internal regions migrate to Dakar and Saint-Louis to work in the fishing industry during the rainy season to finance their **agricultural activities**. At the same time, the **local fishing industries** themselves are impacted by urbanisation and the rural exodus, as well as the climate crisis, particularly in the form of coastal erosion (Zickgraf, 2018). These fishing communities in Dakar and Saint Louis are, thus, simultaneously arrival and transit points for migrants from internal rural areas, as well as some neighbouring countries, and departure points for a small minority seeking to reach a better life in Europe.

These sites allow for analysis of how, in addition to underlying issues such as poverty, **limited channels for regular migration** continue to compel some people (a small minority) to undertake extremely perilous journeys across the Atlantic to Europe (IOM, 2021)²³ and to examine the interactions of the climate crisis with these complex and diverse movements. It is important to note here that **in Senegal the vast majority of movements are internal**, the areas in this report have been purposefully selected to show some of the complexities of climate mobilities and how unjust border policies interlink with the climate crisis to create risks not only for livelihoods, but lives.

23. According to the International Organisation for Migration (IOM) at least 937 migrants died in 2021 trying to reach Spain's Canary Islands via the Atlantic. However, the actual number of deaths is likely to be much higher as many 'invisible shipwrecks' without survivors are never detected (see also: <https://missingmigrants.iom.int/>).



9. RESEARCH FINDINGS

The following sections briefly report the main findings of the qualitative research conducted combined with the results of the desk analysis. The findings have been grouped into overarching

themes relating to the impact of the climate crisis and the nexus with migration: hostile environment, waste, fishing and mobility.

9.1 HOSTILE ENVIRONMENT

Senegal has a high incidence of climate-sensitive economic activities, including farming and fishing. Climate sensitivity is exacerbated by the fact that over 65% of the Senegalese population live in coastal areas, mostly concentrated around Dakar and other urban areas (Ndour et al., 2018). Senegal's coastal areas are highly environmentally fragile and face sea level rise, coastal erosion, soil salinization, pollution, maritime storms and depletion of fish stocks and biodiversity (Amara et al. 2019). Senegal is ranked as the world's eighth most at-risk country in terms of sea-level rise (Amara et al. 2019). In Senegal, urban expansion is also partly based upon a capitalist extractivist system rooted in colonial histories of exploitation (Bernards, 2019, 2020).

Over the past few decades climate trends have been characterised by a generalised variability which manifests in extreme events in terms of intensity and duration. Thus, it is possible to observe long periods of drought – concentrated mostly in the arid and semi-arid Sahelian regions of the country – and floods, where the severity of the impact is determined by a combination of heavy rains and poorly planned drainage systems and storm surges (especially around Dakar, Saint

Louis, Matam, Kaolack, Thies, Diourbel, Kolda, Kaffrine, and Tambacounda).

According to the recent IPCC report (2021) sea levels on the West African coast are rising by between 3.5 and four millimetres (0.14 and 0.16 inches) annually. Coastal erosion in Senegal is determined by both natural processes (swell wave regime, meteorological events, and rising sea levels, and also by human actions, particularly unplanned rural migrations and rapid urbanisation, much of which was caused by the drought that affected the hinterland of Senegal during the 1970s (Gueye, Fall, and Tall, 2015), as well as illegal sand mining for construction (Ndour et al., 2018). The drought also caused the loss of many trees that provided protection along the shore.

In Rufisque, a city in the Dakar region of western Senegal, Fatou Dieng, Bajenu Gox who works in the Municipal Council explained the link between sea-level rise, as caused by increased global temperatures, with more local issues. She reveals the interplay between global greenhouse gases, the ongoing repercussions of the drought in the 1970s, together with increased urbanisation led to the coastal erosion in Rufisque and many people lost their houses:

“ The melting of the icebergs increases the sea level, which has to do with the greenhouse effect. We are affected here because our area is deprived of trees. Before this coast was protected by trees and cactus (*Opuntia tuna*) shrubs that have now disappeared and that used to stabilise the coast. This made it easy for coastal erosion to take place.”

“ All this area along the beach where we are right now used to be inhabited by our grandparents. At that time the sea was far; women had to make a long walk to get to the sea to wash their utensils. The sea kept advancing and our parents had to relocate [...] All this place was full of houses that got displaced.”

Fatou Dieng



The beach in St. Louis ©ElenaGiacomelli

St. Louis is particularly vulnerable to the climate crisis, also as a result of its geography. The city's historic centre is located on an island in the Senegal river, on the other side of the Atlantic Ocean. A peninsula known as La Langue Barbarie, a narrow sand spit of almost 30 km in length, protects it from the Atlantic. **Sea level rise** and **two major storms** surges in 2017 and 2018 which destroyed houses, left more than 3,200 people homeless in Saint Louis— about 1,500 of them now live in

a displacement camp in Djougop, further inland. This site is called by the locals 'Khar Yalla' (literally meaning 'waiting for God'). The name reflects their sense of abandonment to divine fate, in the absence of state intervention, having been left on this site that all participants maintained is inappropriate. It is far from the sea, meaning that both men and women must travel the extra kilometres to reach the sea that they need for their livelihoods.

“ *I will soon be here for three years and until now we have neither water nor electricity, we have nothing. We don't know what the future holds for us. We are here, waiting for God (khar yalla), because no one has come to ask about our situation.... we came here because we had no choice. Imagine moving someone who has lived in one place for 35 years to a place where there is no water or electricity.... My old house was destroyed by the sea, it had tiles and was beautiful, now I am here ... It's really hard...”*

Mamadou Khary Seck, Khar Yalla

“ *My house was destroyed by the sea. Now I live in Khar yalla. I was moved there. There is no electricity or water there and it is very difficult. When it rains, the houses flood”.*

Aminatta, Guet Ndar, Saint Louis

Women all agreed that this is a 'very bad place', complaining particularly of having to buy the water and pay for the bus journey to go to work. This adds extra time and costs to their daily lives. As Fatou explains in the focus group, "there is no electricity and no water.

Also, there is no TV so there is no news and no information about the rest of the world. There is no water inside the houses, women have to walk to get it and it is hard to do. I have to leave Khar yalla every day and take a bus and pay to travel. There is no help from the government."

Here **the gendered impacts of the climate crisis are evident**: the ecological and health burdens of flooding or water scarcity which are disproportionately borne by women because of their greater domestic duties and gendered roles in the household (Ajibade and Siders, 2021). However, it is not solely gender which creates additional vulnerabilities but rather **the intersection of diverse social categories**, including age and wealth. Indeed, those with the **social or economic capital** moved elsewhere as opposed to this inhospitable site, far from the sea where most people's livelihoods are based, and subject to flooding in the rainy season and without electricity or water.

“ The houses built [in Khar Yalla] were not suitable for people. But even so, in the end, there are people who have gone to live there, even if it is badly done. [...] but others who have the means have gone to buy a house elsewhere.”

“ When it rains, the water table rises again causing flooding. So they said we will also move there, [...] We refused. We didn't even think of going to live there because I don't want to leave my beautiful house and go and live in a hut”.

Samba Sarr, Saint Louis

Khar Yalla is a temporary site. People will be moved out over the course of the next three years to a World Bank sponsored programme. This is one of the first ever planned relocation programmes in Africa: the Saint Louis Emergency Recovery and Resilience Project²⁴.

Whilst the new site is again far from the sea, there will be electricity and running water, and the programme foresees employment opportunities being created on site. Nonetheless, distance from the sea for fisher people is perceived as problematic.

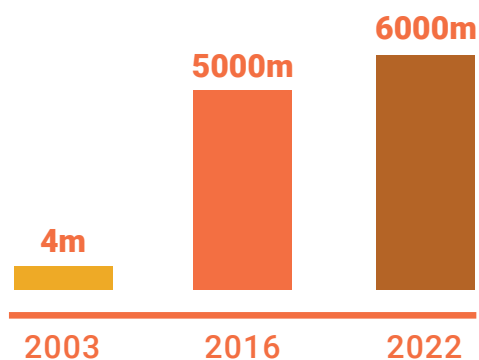
24. <https://www.worldbank.org/en/news/loans-credits/2020/08/06/senegal-saint-louis-emergency-recovery-and-resilience-project-additional-financing>



Khar Yalla, temporary displacement site ©ElenaGiacomelli

However, there are also human interventions which have worsened the environmental situation. As a quick fix to protect Saint Louis from the risk of flooding from a rapidly rising river in 2003, the local government dug a four-metre-wide breach, or canal, cutting through La Langue Barbarie. This had dramatic consequences, notably by acting as a new river mouth that underwent rapid and significant widening (Anthony, 2015). The average erosion rate of -3.72 m/yr affecting the entire Langue de Barbarie was heavily destabilized by the artificial breach, which has widened from 4 m when it first opened on October 3, 2003, to more than 5000 m in 2016 (Ndour et al., 2018) and is now 6km according to interviewees.

THE WIDENING OF THE ARTIFICIAL BREACH IN LANGUE DE BARBARIE



This has also increased the size of the swell waves making it more dangerous for fishing boats (Ibid.) This engineering error has also upset the delicate balance of the local ecosystem as the artificial canal brought seawater into the river, increasing its salinity level. The resulting soil salinization has damaged local crops, already destabilised by irregular rainy seasons and sandstorms.

Ameth Sène Diagne, former chief of Doun Baba Dieye, a village that was submerged under the sea as a result of the breach notes how: **“There is not even a house anymore!** Only one building remains standing and then you can only get there by pirogue [traditional wooden fishing boats].” Interviewees reported how the impact of coastal erosion and sea-level rise is destroying not only the physical landscape, but also **livelihoods and memories**. As Ameth Diagne recounts, the tree that now only exists as branches emerging from the water, is where he once proposed to his wife; A space that no longer exists outside of his memory.

Diagne maintains that indigenous knowledge was overlooked, leading to the imposition of technocratic knowledge from outside - the breach - which led to the loss of many lives:

“*Nobody asked our opinion; in Senegal when you are not a graduate, you are not consulted on anything, you are taken for a sheep. This is a mistake, because knowledge is everywhere, practice is the basis of all this theory that is used today. We have learned by doing*”.

Ameth Diagne

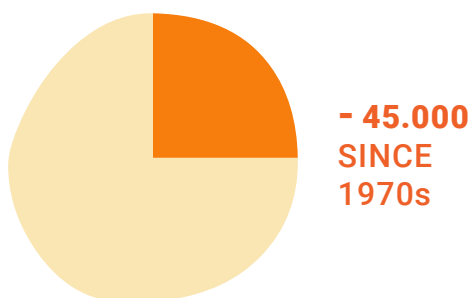
Diagne focuses on reforestation to protect the remaining shoreline: “For example, just for the filao, I have planted 37,000 in the area, from 2010 to now. As for the mangrove, I have covered more than 150 hectares.” The aim is for the mangroves and filao trees (an exotic species of pine), to protect against the destruction of the shoreline. These are trees which have been shown to help fix the sand dunes (Anthony, 2015).

37.000 TREES PLANTED

150 HECTARES COVERED

Senegal has 185.000 hectares of **mangrove** estuaries in its coastal zone, but they are rapidly disappearing. 45.000 hectares of mangroves - which represent 1/4 of the total surface area - have already been lost since the 1970s.

185.000 HECTARES OF MANGROVE



The mangrove restoration project in Senegal, coordinated since 2011 by the Livelihoods Carbon Fund (LCF), aims at helping local fishing communities to tackle climate change.²⁵ Mangroves can help prevent soil erosion, serve as effective filtration systems that prevent soil salinization, hold back rising sea levels, as well as promote marine ecosystems and produce fish resources and wood.

Since 1984 the Senegalese NGO Oceanium²⁶ has

been working to promote environmental preservation and restoration of Mangroves. The project has been validated by the UNFCCC Board. Mangroves are extremely important in climate mitigation as they can store carbon, reduce flooding and erosion, as they act as a buffer from storm surges, as well as being important nurseries for fish, and filter pollutants from water. Mangrove forests are among the most carbon-dense ecosystems in the world and their soils can act as long-term carbon sinks (Sanderman et al., 2018).

Floods are one of the most serious hazards in Senegal. Dakar is particularly vulnerable to flooding, predominantly due to high urban density and lack of planning (Gueye, Fall, and Tall, 2015).

Flooding was a common discussion point in the climate diaries from Dakar and Saint Louis, with many participants sharing photos depicting flooding.

As the example from Seydina below reveals (figure X), Dalifort in Dakar is subject to severe flooding in the rainy season. A combination of extra intense and heavy rainfalls caused by the climate crisis, but also poor drainage and sewage systems in a city of rapid and unplanned urbanisation.

The images shared reveal the wider impacts and causes of the climate crisis and the interconnections between urbanisation and climate vulnerability.

25. <https://livelihoods.eu/portfolio/oceanium-senegal/>

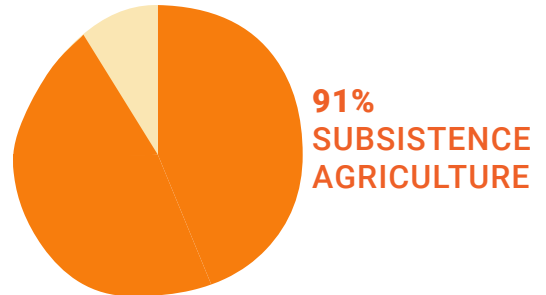
26. <http://www.oceanium-dakar.com/Presentation-de-l-Oceanium.html?lang=en>



Seydina: "Flooding in Dalifort during the rainy season"

74% OF RURAL HOUSEHOLDS

of these



Internal rural areas are facing increasing pressure on farmland and a rapid increase in environmental degradation. Climate variations, such as recurrent droughts, and a consistent population growth rate have further intensified it. One third of Senegalese soils are now highly degraded, and the consequences are estimated to be affecting the livelihoods of half of the population (Leenaars, van Oostrum, Ruiperez Gonzalez, 2014). Agricultural households account for 74 percent of rural households, and 91 percent of them practice subsistence agriculture (ANSD, 2014). This is leading to continued rural exodus.



Waste alongside a beach in Saint-Louis ©ElenaGiacomelli

9.2 WASTE

Waste is a critical issue in Senegal, along the chain from producer to dumping/waste management. Waste management is both a behavioural and structural issue. Most of the waste is household waste and people lack waste infrastructures, but management also requires a top-down approach (Hutson, 2021). Waste, predominantly plastic, but also clothing, is strewn everywhere, except the tourist beaches, magically cleaned of this detritus. This causes health and sanitation issues and is also problematic for ocean biodiversity. Indeed, in urban areas, an increasing amount of waste is visible, which affects both the process of disposal and purification of water as well as the rainwater runoff (Armando, LVIA, remote interview). It also has problematic impacts on marine life. Indeed, plastic pollution has long been documented as severely damaging to marine life and has been found in the bodies of fish and other ocean life, microplastics moving up the food chain to reach even humans (Cirino, 2019; Jamieson et al., 2019; Nelms et al., 2020).

Waste emerged strongly in the climate diaries from Dakar, where many participants chose to share pictures of the rubbish deteriorating their local environment.

They also shared images of their numerous 'clean up' activities and awareness raising to try and stem the flow of rubbish littering their beaches and streets. Photos revealed change over time, beaches such as Hann Bay that 'used to rank second on the classification of the nicest bays of the world' (Fakalè, Hann Bay, Dakar), is now a place where it is no longer possible to swim due to water pollution. Hann Bay is now among the most polluted in West Africa and is the first industrial zone in West Africa, accommodating about 70 - 80% of Senegal's industries (Lewis, 2016).

Djoumblack shared photos of Hann Bay before and after as part of his climate diary

“ I chose these photos taken in 1957 and 2021. Before, the population number was low, particularly in Hann and there were not many industries. Climate change has natural causes but the main causes are due to human activities. Now, Hann Bel air is an industrial zone if you look at the number of industries that are located here. These industries don't follow the environmental regulations because they dump their wastewater into the sea through open air channels. Their wastewater contains toxic products that now prevent people from swimming in the sea. The population also has its share of responsibility because their houses don't meet the urbanization norms and they don't respect the sanitation regulations because most of them dispose of their rubbish into the sea.”

Djoumblack



Hann Bay's pollution is caused by wastewater from many industrial sources, including chemical companies, an abattoir, and an oil refinery (Lewis, 2016). Additionally, as with other areas in Senegal, Dakar's sanitation infrastructure has not kept up with its rapid growth. As a result, some Hann

Bay residents have little choice but to dump rubbish and sanitary waste directly into the canals that feed into the bay (Lewis, 2016). Interviewees in all areas confirmed that municipalities are supposed to address waste issues but do not, there is also a lack of political will at governmental level.

“ *The beach sand was alive and used to groan when walking on. Now it is not like this. The sand is now dead because there is so much trash, dirt and wastewater that are dumped in the bay that it is now dead.*”

Abdoulaye Diouf, Thiaroye Sur Mer, Dakar

Abdoulaye Diouf, an environmentalist who works on awareness raising around waste management, is one of the founders of the **Doleel Thiaroye Sur**

Mer (Strengthening Thiaroye Sur Mer) association in Dakar. He explains the impact of sea pollution further:

“ *As you can see, the beach is full of rubbish, which chases the fish because they are unable to breathe. If the fish are unable to live in an appropriate environment, at the right temperature, they will move elsewhere. The fishermen then have to work harder to reach the fish that move to places that are the domain of the big boats. That is the problem.*”

Abdoulaye Diouf, Thiaroye Sur Mer, Dakar

Abdoulaye Diouf explains how they set up a waste management system whereby rubbish bins were placed in locals' houses, 'because it requires personal engagement', and collected once every two days.

However, he explains the social issue that emerges as participants are expected to make a monthly contribution to cover rubbish collectors' salaries.

“ *This requires a behaviour change because for 50 years some people have been dumping their rubbish in the sea, so they find it illogical to pay for collection. Normally, the municipality should be in charge of rubbish collection, but it fails to do this. People should step up to avoid polluting the sea, as this leads to the scarcity of fish that then impacts the whole of society since people will not be able to make a livelihood.*”

“ *There is a lack of vision. We belong to humankind and humanity is expected to adapt, to change, to think and forecast. We are not part of humanity to just live the present, but also the future. Look, these are plastic and rubber materials and there will be future generations. There are companies that could recycle these materials. 'Ordure' (rubbish) means 'Or-dur' (hard gold). We should create added value by being creative. For example, at Université Cheikh Anta Diop de Dakar (UCAD) University, there is a research project through which they develop a system to recycle the plastic to make cobblestones that are very hard. That is the solution.*”

Abdoulaye Diouf, Thiaroye Sur Mer, Dakar

In Rufisque, another fishing area of Dakar, locals have transformed a former open landfill into a community ecological centre, encouraging recycling and rubbish collection. This is “to reduce the impact due to the trash methanation and to reduce the sea pollution caused by rubbish disposal in the sea.”

Samba Sarr, an artist and environmentalist from Saint Louis set up the association Jeunesse Environment Education (JEE)²⁷ to deal with the “mostly plastic waste” in his local area of the city. He also uses art to raise awareness about plastic pollution.²⁸

“ Waste comes from humans. It is humans who produce this waste, but there is a real problem of management. For example, I do the sorting at home, but it is very rare to see others doing the same thing at home. [...] The problem is that not only are people not trained to manage it, but also adequate equipment for this purpose does not exist here... The rubbish collection vehicles do not come here and there is only one cart to do this collection work. Can you imagine, in the whole of Keur Barka, just one person who has volunteered to provide a cart to collect the rubbish? That’s really a problem!”

Samba Sarr, Saint Louis



Figure 15 A 'Goby'

Samba Sarr engages in awareness raising and waste collection initiatives, working with schools and local people:

“ Each school has been given a Goby. A Goby is a plastic collection container, and we have created an Environment Club with the pupils. To make them aware, to teach them to sort. Not only to reduce but to sort plastic waste”.

Samba Sarr, Saint Louis

27. <https://www.facebook.com/AssoJEE/>

28. <https://www.facebook.com/forsopi/>



Samba Sarr, artist and environmentalist from Saint-Louis ©ElenaGiacomelli

However, Sarr bemoans the lack of political will or engagement in this issue.

“ *The population is powerless. Only the associations are active. For waste, for example, it is the associations that mobilise for citizen actions. Apart from that, we cannot force the government to act. All we can do is protest, denounce or engage in citizen actions*”.

Samba Sarr, Saint Louis

Large cities like Dakar do not have any professional sanitary disposal sites and almost 70% of the solid waste is deposited in unauthorised waste disposal sites. One of the largest landfill sites in Africa, Mbeubeuss is found in Senegal. The Mbeubeuss landfill site was created in 1968 on a drying lake and sits on a flood plain about 30km outside Dakar, close to the sea. It has dramatically expanded in recent years, and at over 114 hectares is one of the largest open-air landfills in the world. Now, 1,300 tons of waste is brought in each day by 230 trucks (Ehui, 2020). Regular fires lead to thick clouds of toxic smoke resulting in health hazards. The challenges of waste disposal in Senegal have exacerbated issues with human health, the environment and urban flooding, and have disproportionately impacted low-income households. Not by chance, Mbeubeuss is situated in the Pikine district of Dakar, the poorest suburb of the city (Cissé, 2012). Flooding in this neighbourhood is also a persistent problem.

Open air, and not fenced off, Mbeubeuss is open to all: birds circle in the hazy smoke-filled sky above, cows from neighbouring areas feed off the rubbish, ingesting the toxic waste. Dotted amongst the waste are small shacks where women prepare coffee for the more than 2000 people who work here (Hutson, 2021). Many are seasonal workers migrating from rural areas for multiple complex reasons, intertwined with the climate crisis (Ribot, Faye and Turner, 2020). People such as Aliou, who left the rural areas of Senegal to come to Dakar in search of work.

Aliou previously worked as a receptionist, but his salary was not enough to cover living costs. He then moved to the landfill site, where he could make more money. He has now worked in Mbeubeuss for over thirteen years, moving up the waste picker career ladder, a hierarchical structure based on the capability to identify and strength to pick the more valuable items of waste (Urselli, 2016). He is one of the founders of the informal association Bokk Djom (group solidarity and courage) which protects the interests of the waste pickers on site, assisting them with health and safety at work.

Mbeubeuss is a site constructed on top of mountains of rubbish. Plastic is highly visible, but also clothing: remnants of the fast fashion industry and its damaging impact on the environment. A report by the Ellen MacArthur Foundation (2017) estimates that more than half of fast fashion produced is disposed of in under a year. Whilst efforts to recycle and re-use clothing do occur in the Global north, much of the clothing collected is then exported to countries with no collection infrastructure of their own, such as Senegal, and ultimately most of these clothes end up in landfills (Ibid.), such as Mbeubeuss. In fact, the organisation maintains that “every second, the equivalent of a rubbish truck load of clothes is burnt or buried in landfill.”

Despite the difficulties of having such a highly stigmatised job, Aliou maintains that he chose to work in Mbeubeuss, which he considers to be: “an essential job that should be recognised by society and rendered more secure and protected.” For Aliou, waste is representative of a society that produces and consumes more than it needs. Of course, the permanent disposal of commodities is an essential part of the planned obsolescence that facilitates continual demand for the new and is central to the production of capitalist value (Rogers, 2005 in Samson, 2015, p. 817). This is clearly seen in the clothing industry where the av-

erage number of times a garment is worn before it ceases to be used has decreased by 36% compared to 15 years ago (Ellen MacArthur Foundation, 2017).

To visit a landfill site is, in the words of the author Guido Viale, to go ‘behind the mirror that the consumer society loves to reflect itself in’ (2000, p. 7). This same mirror hides this world from Europeans. Indeed, many EU Member States continue to send their waste to the Most Affected People and Areas (MAPAs), including countries such as Senegal, which are unable to manage their own waste (Hutson, 2021).



Fama Sylla and her son lost their house close to the coast and moved to Khyar Yalla ©ElenaGiacomelli



Figure 18 Marine artisanal fishermen ©ElenaGiacomelli

9.3 FISHING

“ Because fishing is more than two million people who are directly or indirectly involved in the fishing sector in Senegal. There are more than 20 related professions, which are linked to fishing: Transforming, fishmonger, people who drive vehicles, people who sell petrol ...All this... There are many jobs. The women who make baskets to put the fish in... There are people who are permanent, but also the farmers who come (to the coast) to work in the fishing industry for 4 or 5 months, after earning money they go back to their village, to their farms, and invest there to develop their agricultural activities, to pay for seeds, fertilisers ...”.

Mustapha Dieng, Secretary General of the National Fishing Labour Union

Fish is currently the planet's most widely traded food commodity: it represents a crucial industry for exporters - in 2018 the global capture fisheries production was 96.4 million tons - and a source of food proteins for importers (FAO 2020). Western Africa waters are rich in marine fisheries resources, which represent a high economic return and fish consumption for local communities. Due to its approximate 500 km of coastline, Senegal is well known in the West African region as a traditional fishing nation and the rising global demand for fish makes Senegal's 'blue gold' an increasingly valuable resource.

In Senegal, the fishing industry is the major source of employment in coastal areas, such as Dakar and St. Louis.

Recent estimates suggest that marine artisanal fisheries alone directly and indirectly employ almost 600,000 people in Senegal, which is about $\frac{1}{5}$ of the working population of the country, from boatbuilders and fishermen to fishmongers and market trader, and around a quarter of the total labour force in fisheries is female, mostly employed in post-harvest jobs, especially in fish processing activities (Daniels et al., 2016).



Pirogues for fishery ©ElenaGiacomelli

BOX 4: ARTISANAL FISHING

Artisanal fishing (or small-scale fishing) is still the predominant livelihood along Senegal's coastline. The FAO International Guidelines for Securing Sustainable Small-scale Fisheries definition for small-scale and artisanal fisheries is:

“Small-scale and artisanal fisheries, encompassing all activities along the value chain – pre-harvest, harvest and post-harvest – undertaken by men and women, play an important role in food security and nutrition, poverty eradication, equitable development and sustainable resource utilisation. Small-scale fisheries contribute about half of global fish catches. When considering catches destined for direct human consumption, the share contributed by the subsector increases to two-thirds. Inland fisheries are particularly important in this respect. Small-scale fisheries employ more than 90 percent of the world’s fishers and fish workers, about half of whom are women. In addition to employment as full- or part-time fishers and fish workers, seasonal or occasional fishing and related activities provide vital supplements to the livelihoods of millions. Many small-scale fishers and fish workers are self-employed and engaged in directly providing food for their household and communities as well as working in commercial fishing, processing and marketing. Fishing and related activities often underpin the local economies in coastal, lakeshore and riparian communities and constitute an engine, generating multiplier effects in other sectors.”

Senegalese fisheries resources are abundant, and their exploitation generates high economic returns for local communities and satisfies local food security. Every day, Senegalese artisanal fishery relies on pirogues (Fontana and Weber 1982), in order to go fishing in the open ocean. The pirogues represent the major vessel for artisanal fisheries, fuel is the largest cost, and they have less access to technology than the industrial sector (Belhabib, Greer and Pauly 2017).

While Goal 14 of the 2030 Sustainable Development Goals calls on states ‘to conserve and sustainably use the oceans, seas and marine resources for sustainable development’, and the initial 2020 negotiations of World Trade Organisation (WTO) to end harmful fisheries subsidies, Sen-

egal is not progressing (Koop and Aldred 2020) and is experiencing a dramatic devastation of the marine ecosystem, which is leading many people involved in the fishing industry with no means to make a livelihood out of it. As reported by Feugeudjaay during his interview:

“ *If the sea were full of fish; nobody would be interested in leaving because nobody wants to kill his own country*”.

Feugeudjaay, Rufisque, Dakar

The crisis has been exacerbated by many factors. The fishing industry is currently being devastated as fish migrate elsewhere as water currents are altering due to a combination of climate change and water pollution, which reduces marine biodiversity (Allison, et al. 2009; Zickgraff, 2018). In this sense, environmental effects include impacts on marine ecosystems (Petrossian 2015) and the depletion and overexploitation of fish stocks beyond legal limits (Liddick 2014; Petrossian 2015). Inland fisheries have suffered from successive droughts in recent decades and changes in the hydrological regimes of major rivers (Blédé, Diouf, Compaoré, 2015). Additionally, Senegal’s open access regime to artisanal fisheries has contributed to the depletion of marine resources and the increase of fish prices. Illegal, unregulated fishing as well as insufficient competitiveness, together with a weak system of governance, has led to losses in market shares and income (Daniels et al., 2016).

Current rates of extraction are driving several species towards extinction and jeopardising the livelihoods of artisanal fishing communities. The destruction of marine habitats is also related to the use of destructive fishing methods, including blast bombing and cyanide fishing and use of prohibited gear, further contributing to the problem of by-catch, the unintended capture of non-target species (Belhabib et al. 2013). Fishing is also being devastated by pollution and poorly regulated waste management, as the previous section evidenced.

Lastly, as reported by many interviewees, a major factor contributing to the destruction of the Senegalese marine ecosystem is ocean grabbing: the overexploitation and depletion of fish stocks beyond legal limits (Liddick 2014; Flothmann et al. 2010; Petrossian 2015) both by foreign industry (over)fishing and by illegal fishing (Tessnow-von, Belhabib and Le Billon 2021).

BOX 5: OCEAN GRABBING

Ocean grabbing is a controversial economic and geopolitical phenomenon that came to the fore in the early 21st century. It concerns the economic and social effects of practices of intense and large-scale exploitation of natural resources, especially fish, present in the oceans and seas, with particular reference to waters near MAPAs.

Often facilitated by politics, laws and bureaucracy, as well as by the market in the Global North, ocean grabbing influences access to marine resources and their control, taking it away from coastal communities and putting it in the hands of large companies and multinationals. This phenomenon removes not only an important economic means of livelihood but also an important source for local food security from fishermen and local communities. In many cases, this over-exploitation contributes to the destruction of the local marine ecosystem.

“ *The sea is now poor with fish. The places where we can find fish are now under the control of the foreign boats. We are obliged to go very far in the sea in order to try to compete against them.*”

Fisherman, Thiaroye Sur Mer, Dakar

The foreign boats are industrial boats from countries in the Global North, such as the EU, Russia and China (Kaczynski and Fluharty, 2002; Allison et al., 2009; Daniels et al., 2016; Okafor-Yarwood and Belhabib, 2020). Overfishing by large industrial trawlers is contributing to the collapse of artisanal fishing – an activity that supports millions of people in coastal areas (see Box 4). Illegal, unreported and unregulated fishing is also a major part of the problem in Senegal (Daniels et al., 2016).

The EU, which has recently adopted a new Protocol to the 2014 fishing agreement with Senegal, has been strongly criticised²⁹ for its role in the depletion of West African fish stocks (Okafor-Yarwood and Belhabib, 2020). Assessment of EU-Senegalese ‘cooperation’ has been found to be negative: from both an environmental and social point of view: fish stocks are depleted and the Senegalese artisanal fishery is disrupted (Kaczynski and Fluharty, 2002; Ayet Puigarnau, 2019; Okafor-Yarwood & Belhabib, 2020; Philippe, 2019).

29. For example from Green Peace: <https://www.greenpeace.org/africa/en/press/12666/europe-wants-senegals-fish-but-rejects-its-migrants/#:~:text=Since%202014%2C%20Senegal%20and%20the,of%20exploitation%20of%20the%20resources>

BOX 6: THE EU-SENEGAL FISHING AGREEMENT

The European Union has signed a series of fisheries partnership agreements and protocols with non-EU countries, which provide for EU financial and technical support in exchange for fishing rights for surplus stocks in the country's exclusive economic zone (EEZ). The first ever EU bilateral fisheries agreement was signed with Senegal in 1979 giving EU vessels access to a wide range of fisheries resources. On 25 April 2014, the EU and Senegal concluded a new Sustainable Fisheries Partnership Agreement and in 2019 it has been tacitly renewed for a 5-year period (Council Decision 2020/1786).

Under the Agreement, Union fishing vessels may only carry out their activities in Senegalese waters if they are in possession of a **fishing authorization** and, while cooperation on surveillance and combating illegal, unreported and unregulated fishing is undertaken by the Parties (art. 8), the Senegalese authorities keep the effective monitoring powers, and the Union shall take all the appropriate steps to ensure that its vessels comply with the provisions of the Agreement (art. 5). In art. 6 the Agreement provides for a **financial contribution** (estimated at EUR 15 253 750) granted by the Union to Senegal with the purpose of a) covering part of the costs of access by Union fishing vessels to Senegalese fishery resources; b) improve Senegal's capacity to formulate and implement a sustainable fisheries policy through sectoral support. In order to keep monitoring the application of the Agreement, a **Joint Committee** – composed of representatives of both the Parties – has been established for controlling the implementation of the Agreement and settling potential disputes between the Parties (art. 7). It meets at least once a year, alternately in Senegal and in the EU. Scientific cooperation is based on the work of a **Joint Scientific Working Group (JSWG)** established by the Joint Committee.

Details on the implementation of the Fisheries Partnership Agreement are included in a Protocol that covers a period of five years from the date on which the Agreement was signed, as stated in Article 16 thereof. The most recent protocol was adopted in 2019 and the Annexes contain further technical details and conditions governing fishing activities by EU vessels.

“ Our problem now is that the sea has lost all its fish stock. The reason is that the sea has been sold. This explains why the men have been taking to boats to migrate to Europe. That is the only option they have since the sea is completely destroyed”.

Ndaye, Rufisque, Dakar

During his interview in St. Louis, Mustapha Dieng, Secretary General of the National Fishing Labour Union, described the EU-Senegal agreement as unfair competition and stated that more control of the sea was needed for Senegalese artisanal fishermen.

The ideal would be not to substitute the existing fishing system with a Western capitalistic one, but to modernise and improve the existing one that, as explained above, provides a livelihood to many Senegalese men and women.

“ Under the International Convention of the United Nations on the law of the sea, a country that does not have a surplus, does not have the right to sign fishing agreements. [...] They say that the European Union signs fisheries partnership agreements on Senegal's surpluses, but Senegal does not have a surplus. [...]. We are a fishing country, we do not have enough resources, so these agreements are biased from the start. The European Union, we know that it contributes a lot to the development of Senegal, but that is no reason for it to come and take our fishing resources, because there are many people who depend directly on these resources!

These agreements target tuna and hake - they are the most expensive fish in Europe and these agreements are especially dangerous, because within the framework of these agreements, there are what are called by-catch fisheries. [...] So that means that these boats can fish everything, they can take everything.

And often they do dangerous fishing which is forbidden in Europe, for example, bottom trawling is forbidden, and here in Senegal, trawlers fishing for hake, engage in bottom trawling and electric fishing and this is forbidden.”

Mustapha Dieng, Secretary General of the National Fishing Labour Union

This complex situation is leading some fishermen to feel they have no choice but to try to migrate. Using the same pirogue used to fish, people try to cross the Atlantic Ocean and find better opportunities in Europe, as described in the subsequent section. It is important to remember here that this

is a small minority of movements. Most are internal. However, for the fishermen losing their livelihoods, the porous border of the sea is a pull. As a fisherman observed: “The fishermen follow the fish: if the fish go to Europe, then the fishermen go there too.”

9.4 MOBILITY

Mobility has long been a key element of livelihood strategies in Senegal, a historical means to diversify revenues and adapt to a resource-poor environment. Over the last few decades however, environmental degradation has increased owing to natural and man-made factors, exacerbating the vulnerability of local households. Simultaneously, changes in migration and land policies are impacting upon mobility as an adaptation strategy (Schöfberger, 2018). A rural exodus towards urban centres in Senegal, particularly Dakar, has been prominent since the late 1960s. However, there is no direct link between periods of drought and the rhythm of departures, instead the link between climate variability and migration to cities is

a complex one and it is important to integrate other vulnerability factors (e.g. liberalisation of agricultural and trade policies, lack of bank credits, post crop losses, and limited resources diversity) (Gueye, Fall, and Tall, 2015).

Notwithstanding the progressive (but limited) coping strategies adopted against the consequences of climate variability, people in rural areas may be pushed to leave their territory when the surrounding environment is hostile and there is a scarce ownership of economic, social and cultural capital. Hence, environmental issues are complementary to economic and social drivers and thus:

“ Environmental migration cannot be said to be 100% environmental”.

Armando, LVIA, remote interview

Indeed, other factors, especially economic and personal ones play a complex intertwined role in migration decisions. As emerged in multiple remote interviews, when the context becomes unbalanced because of the increasing social, economic and environmental vulnerability, people may decide to move (“When something is missing in the environment I live in, then I decide to move” - African Movement of Working Children and Youth - AMWCY, remote interview). Plus, as pointed out by Geddes et al. (2012), given the large role economic motives have to play, migration may then be towards environmental risk in cities like Dakar. This was reflected in empirical findings from fieldwork in Senegal. Participants reported many people moving to Saint Louis and Dakar from other regions of Senegal. These are mostly **seasonal movements** of people mainly seeking to work in coastal/urban areas and return to their home region in Senegal, or perhaps to save money for the dangerous journey via pirogue across the Atlantic to Spain (the Canary Islands) where they believe they can find the employment that is not available

to them in Senegal. This is a form of **two-step migration**, firstly from rural to urban and then from urban areas to third countries, also identified in the remote interviews.

The **low passport ranking of Senegal** in the passport index³⁰ (rankings are based on the number of destinations their holders can access), and a highly restrictive visa system, which has exorbitant costs (Sow, Marmer, and Scheffran, 2016), was recognised by participants. **This means that regular channels to migrate are extremely limited and leave little mobility options. Many people wanted simply the option to go (to work or study) and return, yet the restrictive nature of the visa system has created a class of ‘excluded people’** (Sow, Marmer, and Scheffran, 2016, p. 239) and they are unable to access legal pathways to the EU.

The lack of choice and limited options for legal pathways to Europe was raised in many interviews and all four of the focus groups. The issue

30. <https://www.passportindex.org/>

of visas led to animated discussions in all the focus groups, where all agreed how hard it was. As Omar explained, getting a visa is “like trying to climb a mountain. It’s too difficult and expensive [...] Everyone knows it is bad to take the pirogue, but there is no choice.”



Image on door in Guet dar, Saint Louis
'El dorado' Barca wala barsakh

Indeed, “**no choice**” was a recurrent and dominant theme that emerged in the focus group and interview discussion of motivations leading a minority of people to take the risky pirogue journey to the Canary Islands/Spain, in Wolof mbeuk-mi. The Wolof motto for which is: “**Barca wala barsakh**” - ‘either we get to Barcelona or we die trying’. Literally, Barcelona or the hereafter. This illegalized journey is seen as a life and death challenge as other, legal routes are not possible (Hernández-Carretero and Carling, 2012; Ifekwunigwe, 2013; Sow, Marmer, and Scheffran, 2016). Fara Konate, journalist and filmmaker from Saint Louis explained how he saw the various links between climate change and migration:

“ Being also a sea people, as the sea advances, we have lost our houses; that’s one! When the sea took our spaces, we were forced to leave and go elsewhere. So, we were on the other side. And on the other side there is no river, there is no sea. We are fishermen, if we don’t have anything to do, we only think of doing one thing: leaving! At the beginning, especially in 2006, because the first wave of migrants was in Saint Louis; the first migrants who left for the Canary Islands left here, Saint Louis. The sea was advancing, the breach was open. And there was another phenomenon as well: the external influence, that is to say, other people coming from other areas and who have relatives abroad, who come to work here just to earn money and leave. And lastly, the fact that we have lost our resources. Especially here we have lost our resources. There are foreign boats plundering our resources, Chinese and others. So, we don’t have houses, we don’t have resources, but we have our pirogues and we leave. So that’s the consequences”.

Fara Konate, journalist and filmmaker, Saint Louis

“ We are all aware of the danger but we are forced to do it!” There is, he maintains, like so many others, ‘no choice’.

Fara Konate, Saint Louis

As Abou, a young geographer from Saint Louis who participated in the climate diary activity, explicitly states in his climate diary 'the youth... no longer has any hope in this country'. This sentiment also emerges from the other young people (all under 35) who shared photos of their lived experiences via the climate diaries, hope is hard to come by here. Interviews too reflected this lack of hope, this lack of a viable environment in which to make a life.

Awa Niang, a young woman from Saint Louis who was displaced after her house was destroyed by a sea level rise and a particularly devastating sea storm explained that her 18-year-old fisherman brother was planning to take the pirogue to Europe. She viewed this decision very sanguinely, on the basis that at least that way there was some possibility of an income "It's just the hope that if he goes there, things will get better for us".

“ My name is Awa Niang. We used to live here in this house (in Guet Ndar), but you can see that about 8 rooms were destroyed by the sea and we had to leave. It's hard, if we had the choice, the family would not have dispersed, we would have lived together. The family is scattered and that's not what we want. Illegal emigration is happening because life is hard now. For us who are fishermen it is even harder, because you can spend 4 to 5 days at sea and come back empty-handed. Some young people could not bear this situation, to see their parents suffer, so they preferred to take the pirogue. The lucky ones arrived at their destination, but others perished at sea, which is another tragedy.

[As a woman, now life is] difficult, very difficult! Because before, with the informal money lending groups³¹, it was good, when you needed money, they lent you money and then you paid it back [without interest]. I used to trade, but now I don't because I can't find any more sources of financing. We rely on the sea as our source of income. If it worked well, maybe we wouldn't have any problems.

So, the situation is really complicated here; fishing is less lucrative now due to climate change and at the same time, you have some people who come from other countries, or internal areas of Senegal, to find job opportunities. And it is very complicated for everybody as it is very difficult for the local population to find opportunities. Some come specifically to work in the sea, they work for 8 or 9 months, then they go back home, either with the money they have earned, or nothing at all! Others come here, but when they have the opportunity to take the pirogue, they migrate. They do not hesitate because they think that it will be easier for them to succeed in life.

As a woman, I don't even think about migrating. I prefer to stay here, close to my family. I have an eighteen-year-old brother who says that he plans to take a pirogue to go to Europe, because it's hard for him here. In my family, the women don't travel, but the men sometimes go to Mauritania or any other place where they hope to find fish. ... My brother says he is ready to take a pirogue to emigrate. He is a fisherman...For me it is the intention that counts. If the intention is to arrive at the destination to succeed, I don't see any problem, because after all, nothing works here, whereas over there, if he finds something, he can send you money. He intends to come back, to get his legal papers to be able to come and go legally. That's what he wants.

31. Traditional informal savings groups in Senegal known as *tontines*.

It's just the hope that if he goes there, things will get better for us. Here it's hard to get by. It's really hope! It's just hope! The CFA franc is weak, so at least the Euro is good. You work there and you earn 5 or 10 euros, when it's converted into francs it's a lot of money. Here you can work from morning to night, you don't even earn 5000 CFA francs (€7.50).

It hurts me a lot that people take this journey and risk death... [...] If we had the choice, we would go through the legal route, with a valid passport and everything. The only option we have is to take the easy way out and hope to get there. I feel very sorry for those who died trying to get to Europe, they all had plans, they left behind their families, for whom they wanted a better life.

When you see certain images of Europe, you want to go there, but sometimes you see that it's also hard there, because you see illegal immigrants, who spend the night in the street. Then you understand that in Europe, if you are not legal, it will be difficult for you to live there.

For me 'international protection' simply means helping us. For fishermen, all that matters is that we improve their working conditions by giving them funds to buy fishing equipment, that they can then pay back once their situation improves."

Awa Niang, Saint Louis

Boat migration is heavily gendered with most migrants being male. Women do not consider this journey, but rather, as Awa Niang attests, invest hope in their male relatives or partners to make the journey and help support the family. In addition to the gendered element, these movements are also related to age, as it is mostly young men who migrate, as well as socio-economic status. Whilst those with the most social and economic capital do not need to risk their lives in such a dangerous journey, some level of economic capital is required to fund the journey. It is then the intersectionality of diverse categories that create enhanced vulnerabilities, rather than one per se.

It is this hope that is missing the lives of the fishing communities in Senegal, devastated by the intertwining of climate crisis and underlying structural issues. Indeed, artisanal fishers are amongst the highest number of people who migrate by boat to Europe for this reason (Sow, Marmer, and Scheffran 2016). Einashe (2018 np) calls migration 'an act not only of survival but of imagination'. Migration is revealed as a tactic of creating futures (Cole 2010 in Griffiths et al., 2013, np), of maintaining hope, as such it becomes an answer to personal difficulties in the MAPAs. It becomes the only means to make a living/ a life:

“ *So people who go to Spain or in the western countries, so when they come back here, they can buy a plot, build a house, they have money... So instead of staying here without doing anything they prefer to go to Europe and work there [...] It's really the desire to succeed in order to help their families”.*

Samba Sarr, Saint Louis

As Modou, during the Dakar focus group explained, the coastal fishing communities have become transit points for people wishing to leave for Europe: *“if you go there, these people are used to going to the sea to fish. Then Europe comes and takes the fish, and there is no barrier in the sea, so we just go to Europe across the sea. In south Senegal and Casamance, people are being pushed to go abroad by their family, going abroad is about getting a stable situation. When you are not in Europe, you are not stable.”*

This was confirmed by consensus within the focus group. Recognition of the systemic issues

underlying migration also emerged during the activist focus group in Dakar. Activists, as defined by one of the participants, Marie Hélène, are artists who engage in activism through “creative actions which seek to change behaviour and build climate justice”. The impact of colonialism on structures, perceptions and aspirations was noted by all participants in this focus group. There was full agreement between participants that the fact that Senegalese politicians sent their children to study in Europe and accessed health care there, also constructed a perception of Europe as a place of progress and modernity, to the detriment of Senegal:

“ Our politicians are the first migrants: when they are ill, they get treatment in Europe, they study in Europe”.

Marie Hélène, Dakar

At the same time, participants were recognizant of the unjust border system rendering opportunities to travel elsewhere very limited. The border system keeps them in place, and forces people to take dangerous journeys across the Atlantic, knowing full well the risks: the hereafter or Spain. What strongly emerged from the focus groups, and subsequent interviews, was that people want only to have the right to travel elsewhere and to RETURN. Instead, the current unjust border system creates a unidirectional flow that blocks people in place or creates difficulties for people

to return. However, most did not want to leave, they wanted the opportunity to be able to STAY in Senegal. As many participants stated, “Senegal is where my life is.” Indeed, it is equally important to have the capacity to choose ‘to be still, to maintain continuity’ (Van Hear, 2017, p. 223). Van Hear refers to this capacity to choose between moving and staying as ‘moving power’ (2017, p. 222). It is this moving power, embedded within the right to work, to a healthy environment, and to stay still, that is missing from the lives of the people in the communities this report focuses upon in Senegal.

BOX CASE STUDY PER UNIBO EXCERPTS FROM ABOU SOW'S CLIMATE DIARY

"Hello my name is Abou Sow, Geographer, I live in Sanar Peulh, Saint Louis"



Traffic in the urban area

"Mobility linked to daily travel has led to traffic problems such as congestion with a high concentration of vehicles noted in the city of Saint-Louis. This situation is accentuated by the socio-professional reconversion of rural households affected by the effects of climate change, such as the abandonment of agricultural land and the absence of pasture for livestock. As a result, they always converge on the city to benefit from the services it offers.

This traffic problem has negative impacts such as reduced working hours for people, reduced income for drivers especially taxis, increased CO₂ in the atmosphere and exposes us to the effects of climate change.



Floods in the city of Saint-Louis

If we go back a little in the history of the city of Saint-Louis, we note that the years of drought led to a change of residence of most of the rural population, in particular a massive rural exodus which provoked an anarchic occupation of the low areas of the city without connecting to the city's sewerage system.

This situation is at the origin of the flooding of the peripheral districts of the city of Saint-Louis, which are located in the Sor suburb. As an example, in 2003, with the return of good rainfall, the Senegal River basin flooded. This resulted in the river overflowing into the flood-prone areas of the city. It is in this context that the breach of Saint-Louis was opened on the night of October 03 to 04 to save the city from rain floods with a width of 4m. and today, it extends over more than 7km causing huge human losses and negative consequences on the economic activities of the population of Saint-Louis.

Finally, to talk about human mobility linked to climate factors, we will refer to this important part (youth) of the population that no longer has any hope in this country because most of them have lost their activities or have been hit by unemployment linked to the lack of policies to support young people and the weakness of their resilience to the effects of climate change. For this reason, they leave for the western countries, hoping to find a better future and to improve their living conditions as well as their families."



Dangerous mobility

Abou's climate diary is thread through with the notions of 'mobility justice' (Sheller, 2018). His images and words strikingly portray the interconnectivity of rapid urbanisation, poor waste management, traffic pollution and diverse forms of climate mobilities. People from rural areas, unable to make a living due to agricultural land degradation, crowd in on urban spaces, themselves heavily affected by the climate crisis and exposed to coastal erosion, as discussed in the above section. Abou connects all these trends.

THEMES EMERGING FROM THE RESEARCH

- Intertwining of social, economic and geo-political factors: climate change; migration; environmental degradation; urbanisation etc.;
- Climate change exacerbates pre-existing conditions;
- Climate change as hegemonic and instrumental discourse: risk of legitimising the current situation, devolving political responsibilities and de-politicizing mobility issues = Climate Change as symptom not cause;
- Those with least social/economic capital most vulnerable to impacts of climate change
- Major risk factors: climate change; political intervention; foreign fishing agreements (mainly EU)- ocean grabbing;
- Rapid and unplanned urbanisation, fuelled by growing rural exodus;
- Lack of waste management (+ EU dumping waste in Senegal);
- Mobility patterns shifted due to the climate crisis (major internal movements from rural to coastal areas such as Saint Louis and Dakar, and some onwards to Canary Islands, Spain).
- Desire for mobility justice – to go and return. Limited by the current border regime.

10. CONCLUSIONS AND SOLUTIONS

The portraits that emerge from the coastal fishing communities around Dakar and in Saint Louis are of places that are becoming less and less habitable, challenged and choked by ecological precarity, excess waste and mobility injustices. Local inhabitants in fishing communities who, owing to their marginalised position within unequal power structures of the global economy, are unable to access freedom of movement and thus regular, safe, channels of migration and instead risk death in perilous journeys across the Atlantic to escape this lack of habitability. However, these movements, whilst perilous and tragic, are a minority of movements, most are internal. As elaborated upon in the above, and explained by research participants, these movements are not directly related to the climate crisis, but rather stem from a number of interrelated factors. Human mobility is highly complex.

The everyday lived experiences of research participants show how the climate crisis is exacerbated by the underlying socio-natural causes. In *Afrotopia* (2019) the Senegalese scholar Felwine Sarr calls for a move away from fossil fuels to a greater environmental awareness and responsible

modes of production in Africa, and, importantly, to draw upon diverse epistemologies, away from Eurocentric extractivist modes of production. The damage of the current extractivist model and capitalist consumer society is strikingly apparent in these areas of Senegal. The circular nature of mobilities from rural to urban, including those such as Aliou who work on the Mbeubeuss landfill site, and the complexities of the destruction of the fishing ecosystem and its devastating impacts on people's lives beyond the fishing communities, given its importance in Senegal's economy and providing livelihoods for so many people.

In terms of Sustainable Development Goals (SDGs), the major challenges faced by Senegal as relates to SDG 14 Life below Water, in relation to biodiversity loss and ocean health is clearly evident in the difficulties faced by pollution and waste reported by participants. This affects marine biodiversity and fish stocks, causing issues for the fishing communities. Work towards improving this could be done as suggested by one of our participants, Saliou Ba an environmentalist in Rufisque:

“ Pollution should be decreased; fishing licences delivered to foreign boats should be considerably decreased; fishing actors should be helped to clean the seabed because most of the marine caves that used to harbour fishes are now full of plastic materials; protected marine zones should be created to promote fish reproduction; and assistance should be provided to Senegal to reinforce its control system [over foreign fishing trawlers], which is a real problem”.

Saliou Ba, Rufisque, Dakar

Waste further complicates the attainment of SDG 6 clean water and sanitation as well as SDG 3 Good health and wellbeing, particularly in relation to deaths attributed to air and ambient pollution. The significant challenges that remain in relation to SDG 15 life on land, particularly in relation to permanent deforestation, could be alleviated by a focus on reforestation, as outlined by Ameth Diagne and others, in relation to planting man-

groves, filao and other species which help fix the soil and protect against coastal erosion.

Participants are engaged and active in seeking to improve their environment and raise awareness of the detrimental impacts of pollution and waste, as well as the wider global climate challenges. For example, the Africans Rising Project, as explained by Marie H el ene Ndiaye, one of the activists in Dakar:

“ As activists, we take actions through awareness raising and advocacy; awareness raising about climate change and its negative effects on the environment and on people; advocacy targeting government authorities for a climatic justice by educating populations on the responses and approaches to be taken to address climate change (such as, reduction of the use of plastic bags, recycling of plastic materials, tree planting...). We intervene mainly through artistic activism (creative actions seeking behaviour change and climatic justice)”.

Marie H el ene Ndiaye, Dakar

Some examples are in the below links:

Mali against plastic:

www.youtube.com/watch?v=Fx2MXDDgL70

Water access:

www.youtube.com/watch?v=G49EXJhNUWU

Marie H el ene was also involved in the virtual exhibition “Invisible Giants”³² which focused upon the important, but often invisibilized, role of women in society.

This report highlights how everything is connected, from mangroves dying, to increased global temperatures causing sea level rise, coastal erosion, storm surges, rural exodus, lack of agricultural investment, social capital, drought and flooding, lack of opportunities, lack of legal migration routes, unequal power dynamics between global north and south, including in social constructions of ‘Europe’ and progress which influences some migratory decisions. But it also highlights how people fight against these power imbalances and seek to make their environment, their ‘climate’ more habitable.

In Senegal, it is possible to go behind the mirror of the capitalist production system and see the real damaging results of the resulting climate crisis on people and the environment. Just as the environmentalists and activists in this report call for, they have the right to live in a safe, clean, healthy and sustainable environment.

Additionally, they also require the right to mobility and enhanced legal channels to go and return, which would alleviate the deaths of the perilous crossing across the Atlantic. Senegalese have been moving historically in relation to the climate for centuries, these movements are now affected by socio-natural causes.

The global disparities highlighted by the crisis are starkly evident in the lives of those in urban coastal areas of Senegal living on land that is disappearing before their very eyes. The site evidences the mingling of socio-political and environmental abandonments that curtails possibilities to address the injustices, creating a hostile environment.

32. <https://www.geantesinvisibles.com/en/>

GUATEMALA

CASE STUDY 2

Massive expansion of oil palm plantations in the community of Sechaj, Alta Verapaz ©RobertoCuxil



GUATEMALA

CASE STUDY 2

Who is the climate migrant? And how can we discuss the complex nexus between the climate crisis and migration in a manner that is productive and beneficial to those whose lives and livelihoods are most at risk from the climate crisis? These are some of the questions that this report grapples with and that have been the focus of much discussion throughout the EU project “**End Climate Change, Start Climate of Change**” (**#ClimateOfChange**), co-funded by the European Union’s Development Education and Awareness Raising Programme (DEAR), within which the research is based. Questions that, sadly, as with all things related to discussions on migration, are deeply political in their nature. In seeking to answer them, we draw upon empirical research from four case study countries: Cambodia, Guatemala, Kenya and Senegal. **This section focuses upon Guatemala.** Research was conducted by the interdisciplinary research team based at the University of Bologna, drawing upon combined sociological, agricultural and food systems, human-geographical and legal perspectives, together with partner organisations on the ground where we were un-

able ourselves to visit the case study countries due to the COVID-19 pandemic.

Guatemala is consistently listed among the world’s 10 most vulnerable countries to the effects of climate change. The impact of climate change is worsening in Guatemala. Due to its geographical location in the tropical belt, natural disasters are increasing in frequency and intensity and are more likely to have significant negative impacts when combined with lack of adaptive capacity. Climate change can be perceived as a multiplier of pre-existing vulnerabilities, such as poverty, lack of resources, food insecurity and so on. Hence, people, especially those working with, and dependent upon, the environment (i.e. the agricultural sector) exposed to the impacts of climate change are more prone to migrate as an adaptation strategy. The departments of Totonicapán and Sololá were selected as communities here practice intensive agriculture and the area is suffering from extensive deforestation, making these territories particularly vulnerable to climate change.



The farmer Matilde Alonzo, in front of a pineapple monocropping field in El Jocotillo ©RobertoCuxil

11. COUNTRY OVERVIEW

Region	Central America
Population	17 582
Human Development Index	0.651 (rank 126/189)
Ethnic Groups ³³	Mestizo (mixed Amerindian-Spanish) 56%, Maya 41.7%, Xinca (indigenous, non-Maya) 1.8%, African descent 0.2%, Garifuna (mixed West and Central African, Island Carib, and Arawak) 0.1%, foreign 0.2%
Rural population (% of total population)	46,1%
Poverty rate ³⁴	59.3%
Natural resources	petroleum, nickel, rare woods, fish, chicle, hydropower
Forested area (% of land area) ³⁵	32.7
Agricultural land ³⁶	41.2% (2018 est.)
CO2 emission estimates (mil. tons/tons p.c.) ³⁷	15.7/ 0.9

The Republic of Guatemala is located in Central America and is bordered by Mexico and Belize to the north, the Atlantic Ocean to the east, and El Salvador, Honduras, and the Pacific Ocean to the south. Two-thirds of the country is mountainous and dominated by a string of volcanic ranges running northwest to southwest. With an estimated population of around 17.5 million, it is the most

populous country in Central America and has the second highest population density after El Salvador. Guatemala was selected as a case study country owing to its high vulnerability to the impacts of the climate crisis. Indeed, it ranks fourth in the global climate risk index (MARN, 2010; Harmeling and Eckstein, 2012).

33. Instituto Nacional de Estadística Guatemala (Portal de Resultados del Censo 2018).

34. UNDP database (<http://hdr.undp.org/en/indicators/39006#a>).

35. UNData- A world of information (<https://data.un.org/en/iso/gt.html>).

36. CIA database (Guatemala - The World Factbook (cia.gov)).

37. UNData- A world of information (<https://data.un.org/en/iso/gt.html>).

The country is severely affected by droughts, cyclones and the El Niño-Southern Oscillation (ENOS) phenomenon. Guatemala is located in a particularly climate vulnerable semi-arid region known as the Dry-Corridor (Van Meerbeeck, 2020). The term 'Dry Corridor' defines a group of ecosystems in the eco-region of dry tropical forests in Central America. In Guatemala, the dry belt comprises the Departments of Quiché, Baja Verapaz, El Progreso, Zacapa, Chiquimula and Jutiapa in the eastern and central region of the country, while for the southern coast it affects the

Departments of Retalhuleu, Escuintla and Santa Rosa. Climate risks in the Dry Corridor are mainly represented by recurrent droughts, excessive rains and severe flooding affecting agricultural production, with greater intensity in degraded areas. Guatemala has a strong indigenous culture, but although the Maya make up about half of the population, they face extreme inequality and marginalization. Almost half (nearly 49%) of the population live in rural areas and are engaged in activities such as agriculture, forestry, cattle raising and fishing, which are climate vulnerable.

BOX 1: SUMMARY OF THE CLIMATE CRISIS IN GUATEMALA

Sudden-onset hazard

Several types of hydro-meteorological disasters (extreme rainstorms, tropical hurricanes, torrential rains, floods) affect most regions of the country and cause floods and landslides. In particular, over the past few decades there have been many urban floods in Guatemala City, Mazatenango, Quetzaltenango, Escuintla and Antigua Guatemala, as well as floods associated with frontal systems or cold fronts, such as the floods in the Petén area, the lower part of Alta Verapaz, northern Quiché and Izabal.

Slow-onset environmental change

Slow-onset events (further exacerbated by human activities) include changes in rainfall patterns (specifically in Petén, Alta Verapaz e Izabal); droughts (the Dry Corridor and changes associated with El Niño variation), deforestation and loss of biodiversity, increase in mean temperature and ocean-level rise (along the coasts).

11.1 STRATEGIES FOR COPING WITH ENVIRONMENTAL AND CLIMATE CHANGE

Guatemala has adopted a number of measures intended to cope with the effects of climate change that deserve to be mentioned. Guatemala has submitted one national communication to the United Nations Framework Convention on Climate Change (UNFCCC) in 2001 outlining Government actions and policy frameworks to address climate change adaptation. In 2009, Guatemala approved a **National Policy on Climate Change** (MARN, 2009) and in 2013 a comprehensive Framework Law to Regulate the Reduction of Vulnerability, the Mandatory Adaptation to the Effects of Climate Change and the Mitigation of Greenhouse Gases (Decree 7-2013, 2013). In this context, a series of legal and technical instruments and governance instances have been created, including the National Climate Change Council (CNCC) - made up of government institutions, civil society, local governments and academic representatives - and the National Information System on Climate Change. Ministerial Agreement number 5-2016 (MARN, 2016), supports this via establishing the norms and procedures for collecting, systematizing, analysing and transferring information. Moreover, the Vice Ministry of Natural Resources became the Vice Ministry of Natural Resources and Climate Change and the Directorate of Climate Change was established to work with different government institutions, such as MAGA, the National Institute of Forests (INAB), the National Council of Protected Areas (CONAP), the MEM, the Ministry of Foreign Relations and the National Coordinator for the Disaster Reduction (CONRED) (Alfaro Marroquín and Gómez 2019).

The elaboration of the **National Action Plan on Climate Change** (PANCC) (CNCC, 2016), framed in the Plan Nacional de Desarrollo K'atun Nuestra Guatemala 2032 (CONADUR, 2014), intends to address the priority actions for reducing vulnerability, improve adaptation and reduce greenhouse gasses emissions within the context of the Framework Law on Climate Change (CNCC, 2016). In a more comprehensive way, other national proposals have been developed, such as the National Development Strategy for Low Greenhouse Gas Emissions, the National Strategy for Addressing Deforestation and Forest Degradation, the Nationally Appropriate Mitigation Actions (NAMA) for the sustainable and efficient use of firewood and sustainable livestock; and other local actions, such as projects for Reducing Emissions from Deforestation and Degradation (REDD +).

In addition to national political strategies, there are a large number of meso and micro-level initiatives and activities organized by NGOs working in the territory. Collective (local) actions are extremely important for tackling environmental problems. At the local level, several community-based adaptation projects have been implemented in rural communities by NGOs, focusing on natural resource management to increase resilience to climate change effects. Examples include projects carried out thanks to the Green Climate Fund (GCF), set up by the UNFCCC in 2010, to help developing countries to enhance their ability to adapt to climate change and to reduce their greenhouse gas emissions.

BOX 2: SUSTAINABLE DEVELOPMENT GOALS (SDGS)

The Sustainable Development Goals (SDGs), also known as the Global Goals, form the core of the 2030 Agenda and were adopted by all United Nations Member States in 2015 as a universal call to action to achieve accelerated, high, inclusive, broad based, sustainable economic growth, social economic transformation and development by 2030.

Guatemala is one of the pioneer countries in incorporating the SDGs into national planning instruments, with a special focus on narrowing the inequality gap (UNDP 2021). According to the Sustainable Development Goals Dashboard Guatemala is maintaining SDG 13 achievement (Climate Action) measured through CO2 emissions, while facing major challenges in SGD 15 (Life on land), regarding the protection, the restoring and the promotion of sustainable use of terrestrial ecosystems, like the management of forests, and tackling land degradation. With regard to water (SDG 6 - Clear water and sanitation), Guatemala is performing well regarding the management of scarce water resources but still facing challenges regarding waste-water treatments and there are no significant improvements in access to improved drinking water for the urban population (SDG 11 - Sustainable cities and communities). All the positive actions that have been taken to date will need to be sustained and used as a foundation to build resilience in the context of COVID-19.



11.2 NATIONAL MIGRATION POLICY

The right of movement is enshrined in art. 26 of the Constitution of Guatemala according to which “[a]ny person has [the] freedom to enter, remain, transit, and exit from the national territory and change domiciles or residences, without other limitations than those established by the law”. In September 2016, the Congress of the Republic of Guatemala approved the Migration Code repealing Decree 95-98. The creation of this law is based on the recognition of the Guatemalan State of the freedom to transit and leave the Guatemalan territory and the change of domicile and residence. According to the current normative framework, the State of Guatemala has obligations in terms of care, assistance and protection of migrants, as well as the duty to comply with the International Convention on the Protection of the Rights of all migrant workers and members of their families ratified in 2003. Important and valuable points of the new code include the right of every person to emigrate or immigrate to Guatemala, as well as to temporary and permanent residence.

At the regional level, in addition to actively participating in the Global Forum on Migration and Development (GFMD), Guatemala participates, as a member of the OAS, in several Regional Consultative Processes on Migration (RCPs) as well as in the Central American Commission of Directors of Migration (OCAM). Guatemala is also Party to the **1984 Cartagena Declaration on Refugees** and, alongside other States, it supported the adoption in 2014 of the **Brazil Declaration and Plan of Action** (BPA) aimed at reinforcing cooperation and providing protection solutions for displaced and stateless persons (including those displaced for climate change, natural disasters) to be performed by 2024. The country is also a member of the **Regional Conference on Migration**, a multilateral body consisting mostly of Central and North American countries, thereby endorsing the Guide to Effective Practices for RCM Member Countries in 2016. The guide offers guidance to RCM Mem-

ber Countries on how they can respond to the temporary humanitarian protection needs of persons affected by sudden-onset disasters using examples from current laws, policies and practices.

At the bilateral level, the Governments of Mexico and Guatemala have signed over 40 agreements and Memorandum of Understanding, including the recent Agreement on Labor Cooperation providing for a labour pilot program whereby nationals of Guatemala may temporarily migrate to Mexico to work in certain industries. In addition, since 2005, Guatemala has been a party to the Convention on the creation of the single Central American visa for the free movement of foreign nationals between the Republics of El Salvador, Honduras, Guatemala and Nicaragua (CA4). The single visa permits free movement for foreign nationals on the territory of any of the Member States. Currently, there are agreements such as the CA4 on the free movement of aliens, as well as customs agreements in place between Honduras, Guatemala and El Salvador, but so far none has addressed the topic of labour mobility.

While significant migratory movements are towards the United States, **no specific agreement between Guatemala and the US regulating migration exists.** In 2019 an agreement between the United States and Guatemala, the US-Guatemala Asylum Cooperative Agreement (ACA) was concluded. It enables the United States to rapidly expel non-Guatemalan asylum seekers (especially from Honduras and San Salvador) to Guatemala without allowing them to lodge asylum claims in the United States, but also leaves them without access to effective protection in Guatemala. As a result, they are effectively compelled to abandon their asylum claims, and some who have a well-founded fear of persecution appear to be returning to their home countries where they are at real risk of serious harm (HRW, 2020).

12. METHODS

Information in this chapter is taken from a combination of different methods and research phases. First, a desk analysis of documents from scientific and grey literature was integrated with semi-structured interviews with key stakeholders and experts working on migration and/or environment in Guatemala. These interviews were conducted remotely via video calling systems (Skype, Zoom) in June-July 2020. Results were integrated with empirical data from fieldwork focus groups, climate diaries, semi-structured interviews conducted by Socialab between April-May 2021 with selected local people affected by the climate crisis in Totonicapán and Sololá. A survey was also conducted by a specialised company, Kantar-Mercaplan, with a representative sample of the Totonicapán population between April-May 2021. The aim of the fieldwork was to examine the lived experiences of climate change impacts in particular of those who experienced migration or had a family member that experienced migration (for further information see Methodology section).



A one-month climate diary

30 participants



4 Focus groups

of 5-10 people each



11 In-depth interviews



400 household surveys

- 1. A one month climate diary:** 30 participants (15 from rural areas, 15 from urban areas).
- 2. Focus groups:** 4 groups (5-10 people each, gender and age diverse), 2 in an urban area (Guatemala city) and 2 from a rural area (1 in Chuicullil Village, Nahualá, Sololá and 1 in Vásquez Village, Totonicapán).
- 3. In-depth interviews:** 11 participants.
- 4. Household surveys:** 400 households, male and female, from 18 to 65 years old, representative of the rural population of the province of Totonicapán having experienced climate change and/or having one migrant member within the Households.

12.1 FOCUS: TOTONICAPÁN E MOMOSTENANGO; SOLOLÁ



The fieldwork, consisting of interviews and a survey, was organised in the departments of Totonicapán and Sololá, located in the Dry Corridor. Here, the communities practice intensive agriculture (mainly production of vegetables, potatoes, apples, corn and previously relevant amounts of wheat). Moreover, the extensive deforestation due to agrarian pressure and population growth, soil degradation and contamination of water flows due to the use of agro-toxins, make these territories particularly vulnerable to climate change, an important cause for migration although it is sometimes hidden.

13. RESEARCH FINDINGS

The following sections briefly report the main findings of the quantitative and qualitative research conducted combined with the results of the desk analysis. The findings have been grouped into overarching themes relating to the impact of the climate crisis and the nexus with migration:

insights from the survey, indigenous and rural population, inequalities and vulnerabilities related to gender, hostile environment, agriculture and deforestation, the (mis)management of natural resources: exacerbating the problem, waste and water.

13.1 INSIGHTS FROM THE SURVEY

The aim of the survey was to analyse different aspects of the rural households of the Totonicapán region in Guatemala, and the strategies they adopt to manage the impacts of climate change, including both migration and in situ adaptation. In particular, we considered overall livelihood strategies, migration patterns by family members, changes in agricultural resources allocation, gender/generational roles and decision making before and after migration, and allocation of remittances.

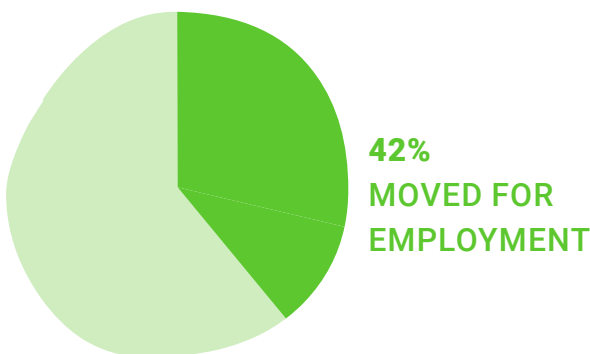
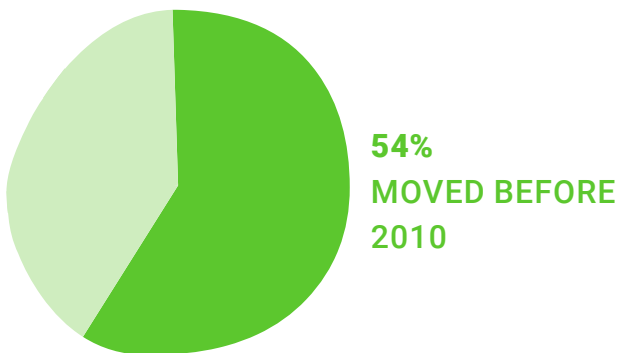
Migration patterns

Immigration: 3.25% of the sample was born outside Totonicapán of which 53.8% moved into the region before 2010; 42,2% moved for employment reasons.

SURVEY SAMPLE

3.25% BORN OUTSIDE TONONICAPÁN

of which



Outmigration: 10% of the sample (in line with national data) reported that they live or have a relative that lives elsewhere some time of the year for work-related reasons, the majority of which (75%) move for less than 4 months (see figure below): of these, 22.5% move abroad and 77.5% move within Guatemala, often to a large urban centre (60%). 3% of the sample has a family member who has migrated permanently for labour in the past 10 years.



SURVEY SAMPLE

10% LIVE ELSEWHERE some time of the year

of which

75% MOVE FOR LESS THAN 4 MONTHS

3% MIGRATED PERMANENTLY in the past 10 years

22.5% MOVE ABROAD

77.5% MOVE WITHIN GUATEMALA

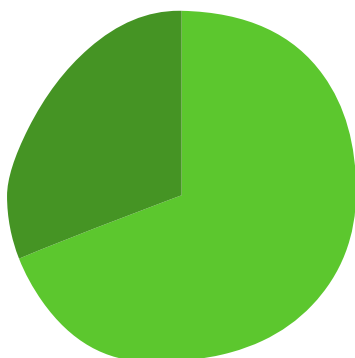
2,75% of the sample have a household member that permanently migrated for labour in the past 10 years. Of these permanent migrants 72,7% were male and 27,3% were female.

SURVEY SAMPLE

2.75% MIGRATED FOR LABOUR in last 10 years

of these

27% WOMEN



73% MEN

In the destination area, 12.5% were employed in farm work, 46.9% were employed in factory or construction work, and 34.4% in other types of skilled jobs (E.g. Business, teachers). 90% of them migrated alone, leaving the family behind.

SURVEY SAMPLE

13% FARM WORK

47% FACTORY OR CONSTRUCTION

34% OTHER TYPES

90% MIGRATED ALONE

Future aspirations: When asked if they plan to move elsewhere in the near future, only 7.2% responded that they are planning to, or wish to. Among these, the three reasons that scored the highest levels of agreement (from 1 “completely disagree” to 10 “Totally agree”) were:

- Lack of initiatives supporting agricultural and rural activities (mean: 4.86%)
- Success stories from other migrants (mean: 6.03%)
- Lack of opportunities for achieving personal aspirations (mean: 7.01%)

SURVEY SAMPLE

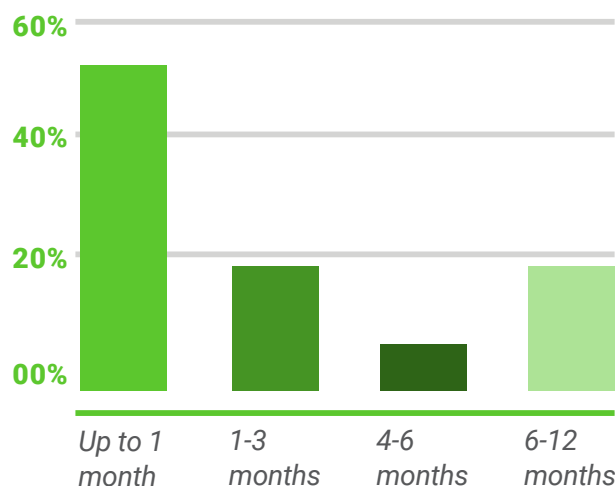
7% PLAN TO MOVE IN THE FUTURE

5% LACK OF SUPPORTING ACTIVITIES

6% SUCCESS STORY FROM OTHERS

7% LACK OF ASPIRATIONS

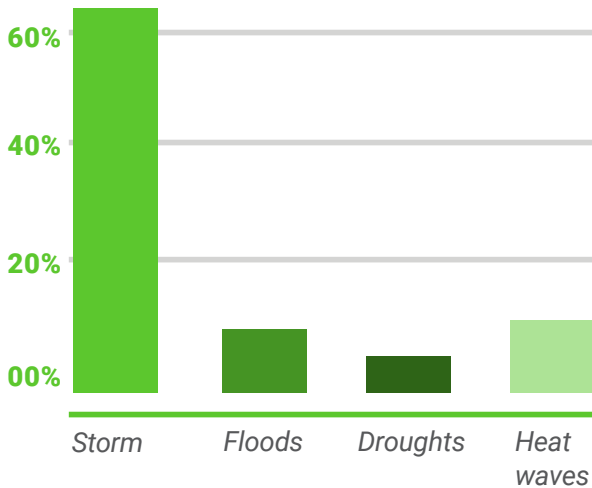
SHARE OF EMIGRANTS PER LENGTH OF EMIGRATION



Exposure to Climate Change

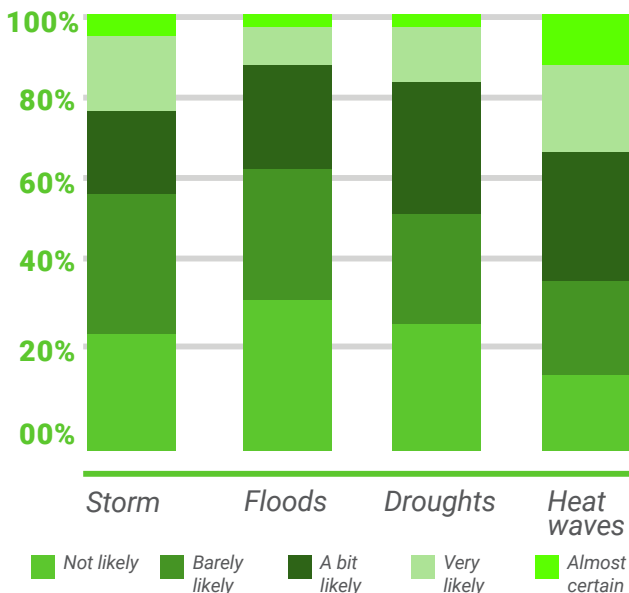
25.3% of the sample reported that they had experienced a climate-related crisis in the past 5 years. Of these families they experienced mainly storms (63.4%) and heat waves (14.9%):

SHARE OF HOUSEHOLDS THAT EXPERIENCED CLIMATE-RELATED CRISIS



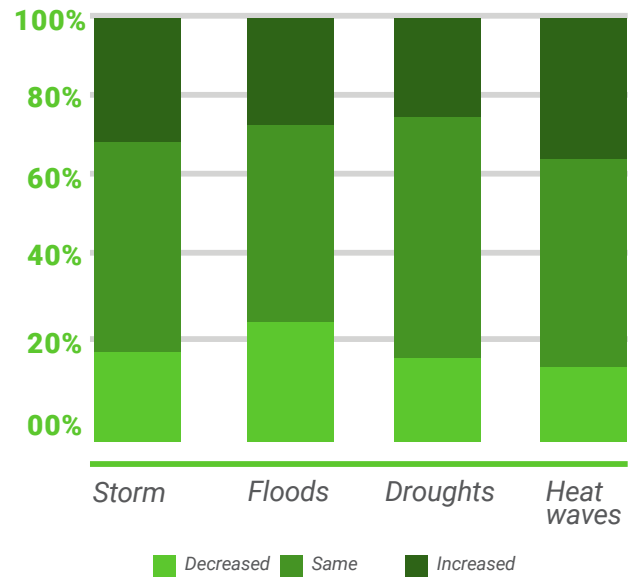
Heat waves are perceived as the most threatening climate-change related phenomenon (31.4% of the sample consider the risk of occurrence to be very likely or almost certain) followed by storms (21.7%) and droughts (12.0%). People in Tonicapán perceive the risk of floods as the least probable. See figure below:

CHANGES IN THE PERCEPTIONS OF BEING EXPOSED TO EXTREME EVENTS ACCORDING TO HOUSEHOLDS



For those who responded to feel 'at least a bit likely to be at risk of exposure' to these extreme events, a sub-question was posed regarding the feeling of increased/decreased exposure in the past 5 years. Results show that risks connected to heat waves remain the risk perceived to have increased the most (35.8% of the respondents). See figure below:

CHANGES IN THE PERCEPTIONS OF BEING EXPOSED TO EXTREME EVENTS ACCORDING TO HOUSEHOLDS



When asked about water access, 27.5% of the sample reported that they had experienced shortages of drinking water in the 12 months prior to the interview.

Regarding food, 15.7% of households reported that they had experienced food shortage in the 12 months prior to the interview but only 3.25% of the sample reported that they depend on their own farm as source of food.

13.2 INDIGENOUS AND RURAL POPULATION

Guatemala is the largest economy in Central America in terms of GDP, one of the most densely populated and one of the poorest countries in the region. More than half of Guatemala's population lives in rural areas, and of that, 70 percent live in poverty.



Farmers, Tonicapán region, Guatemala

Guatemala presents a Human Development Index of 0.651 (medium) but, despite the constant growth in national GDP, it faces persistent poverty and inequality rates between geographical areas and among ethnic groups.

Indigenous and rural populations remain economically and socially marginalised. Since the signing of the Peace Accords (1996)⁴¹, Guatemala has been recognized as a multicultural, multi-ethnic and multilingual nation, made up of three indigenous peoples (Mayan, Xinca and Garifuna). According to the 2018 census, 43.56% of the population is Indigenous including 41.7% Mayan, 1.8% Xinca, and 0.1% Garifuna (Mixed African and indigenous). In Tonicapán this percentage increases to 98% (INE 2018).

41. The Guatemalan Civil War was fought from 1960 to 1996 between the government of Guatemala and various leftist rebel groups, which were primarily supported by ethnic Maya indigenous peoples and Ladino peasants. After 36 years of civil war between the Guatemalan government and the Marxist rebel army, the Guatemalan National Revolutionary Unit, the conclusion of this Accord for a Firm and Lasting Peace brought to an end one of Latin America's longest-running internal armed conflicts. The Peace Accords led to state recognition of the rights of Guatemala's indigenous communities for the first time in the country's history, and set the stage for subsequent government recognition of women's and indigenous' rights.



The large amounts of pesticides dumped into the water by large monoculture industries produce several ecocides ©ValeriaLeiva

“ *There is an economic and social structure of great inequalities in Guatemala. [...] It is precisely in the areas with the highest levels of poverty and extreme poverty where the majority of the indigenous population lives. And as a consequence, indigenous people have also been migrating the most in search of economic alternatives to survive.*”

Juan José Hurtado Paz y Paz, Director of the Association Pop No’j

Moreover, there is a serious degree of horizontal (and vertical) inequalities across ethnic divisions (Thorp, Caumartin and Gray-Molina, 2006). The legacy of oppression and historical trauma from colonisation to the civil war (resulting in an ethnocide of indigenous people) led to unequal and unjust conditions between Ladinos (mixed Native American-African-Spanish) and Mayans (Scarnato, 2018). The structural inequalities in Guatemala have a long history (Green, 2009) and are still quite relevant nowadays: poverty among indigenous people averages 79%, with 40% of the indigenous population living in extreme poverty. Specifically, historical political disenfranchise-

ment, exploitation of indigenous communal land, exclusionary educational policies and forced labour contributed to today’s inequalities (Thorp, Caumartin and Gray-Molina, 2006). Juan José Hurtado Paz y Paz refers to a “racist and discriminatory structure of the State that has justified the exploitation of native peoples” (Juan José Hurtado Paz y Paz, Director of the association Pop No’j). Indigenous peoples frequently do not have an equal voice in national and departmental decision-making, as a result they experience unequal access to healthcare, educational opportunities, nutritious food, and jobs.

13.3 INEQUALITIES AND VULNERABILITIES RELATED TO GENDER

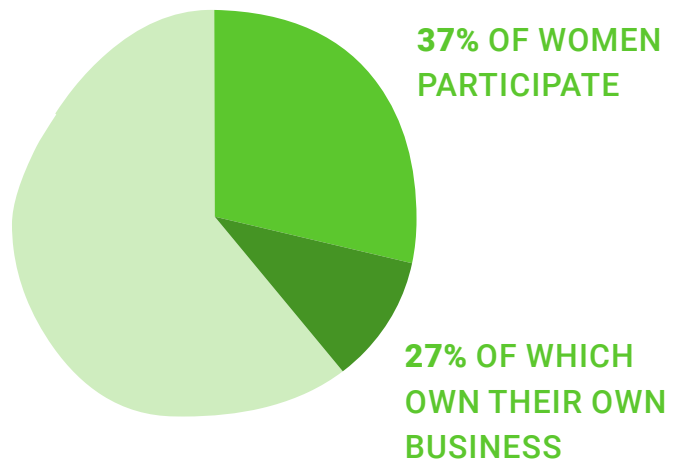
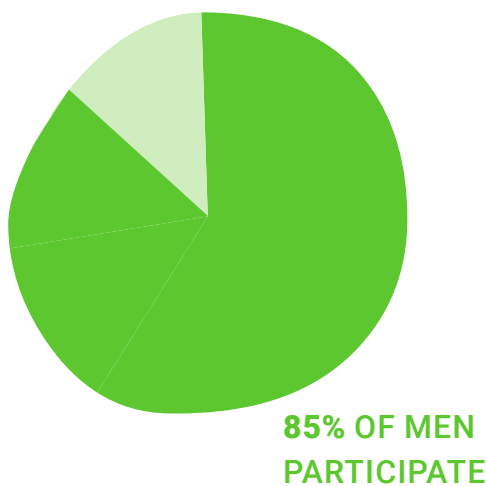
Guatemalan society, like many other countries the world over, has a strong history of discrimination of indigenous populations in general, and women in particular (Piedrasanta, 2016). This manifests as gender gaps across a variety of sectors and public services, impacting women’s participation in the formal economy, their exercise of political and social leadership, and their access to goods, resources, and services (MARN 2017).

Discrimination in access to education, labour participation and in general to public services enhances vulnerabilities (Millard and Lara-Flori-

an 2018). Women tend to run fewer businesses, own less property, have greater difficulty entering the formal labour market, and have less access to credit and financing than men.

Only 37% of women participate in the formal labour market (as opposed to 85% of men), 27% own their own business, and 28% have access to financial markets (as opposed to 66% of men) (INE 2020b). Only 2% of municipalities are run by women; more than 4,000 girls 10-14 years of age give birth every year (UNWomen, 2020).

FORMAL LABOUR MARKET:



66% ACCESS TO FINANCIAL MARKETS

28% ACCESS TO FINANCIAL MARKETS

Women also struggle to access social services such as education and health and are more often the victims of violent crime. According to the Public Ministry, violence against women is the most commonly reported crime in Guatemala with 51,906 complaints filed in 2018 and more than 12,000 women murdered in the last 20 years in the country (USAid, 2020).

Reports show that the loss produced by natural

disasters directly affects the more vulnerable populations, elderly, women – especially indigenous women – children and particularly those who live in poor rural areas and that six out of ten migrating women are raped during their journey, and girls traveling alone and LGBTQI+ are at high risk of trafficking in persons (Hernández Bonilla and Morales Orellana 2020).

13.4 HOSTILE ENVIRONMENT

According to the State of the Climate in Latin America and the Caribbean 2020 issued by the World Meteorological Organisation (WMO) “Latin America and the Caribbean (LAC) is among the regions most challenged by extreme hydro-meteorological events. [...] Notable impacts included water and energy-related shortages, agricultural losses, displacement and compromised health and safety, all compounding challenges from the COVID-19 pandemic” (WMO, 2021).

Indeed, due to their topographical characteristics and their geoclimatic location, Central American countries are exposed to high climatic risk and variability and the consequent threats in terms of loss of human and economic life when extreme climatic events occur. Likewise, the region is severely affected by droughts, cyclones and the El Niño-Southern Oscillation (ENOS) phenomenon (Benegas, 2006; CCAD and SICA, 2011).

Hence, in 2011 Central America was considered by the United Nations Convention on Climate Change as a “region highly vulnerable to the impacts of climate change” (Harmeling and Eckstein, 2012).



Floods in Tonicapán region, Guatemala

“ Guatemala is in one of the most vulnerable regions in the world. We experience all the impacts of this climate change, such as tropical storms, such as earthquakes, such as changes in the climate that affect especially production.”

Luisa

The physical-geographical conditions of Guatemala make it highly vulnerable to hurricanes, storms and other extreme weather events, especially in the Dry Corridor. Exposure in Guatemala is both to low frequency and high impact events, such as earthquakes, volcanoes and hurricanes, and to high frequency and low impact events, such as floods and landslides. Guatemala's patterns of precipitation and temperature are affected by fluctuations in the temperature of the surrounding oceans, the interaction of the atmospheric circulation with the Sierra Madre volcanic mountain ranges.

The El Niño phenomenon magnifies vulnerability

in the region, in particular, causing frequent severe droughts in the eastern portion of Guatemala. Climate change then exacerbates the effects of natural disasters. Indeed, Guatemala is part of the **Climate Vulnerable Forum** (CVF), which is a global partnership of countries from Africa, Central America and Asia, that are disproportionately affected by the consequences of climate change. It has changed the duration of the seasons normally characterised by the rainy season from May to October and a dry season from November to April. However, in recent years the rainy season only commenced in June and a larger amount of rain falls in a shorter period.

“ *But this also happens due to climate change, that there is no stability of the weather. Before there were six months of heat and six months of winter. So, in the face of the change of the same environment that man himself is causing, these floods occur. It rains too much in one place, and perhaps in another it doesn't rain at all. We have the case of the Dry Corridor, that we have there, that is Camotan and I don't know which other places... So I say, these people are bathing in water and the others in heat... it does not compensate and the crops are totally lost*”.

Focus group – Urban 1

According to the Climate Change Knowledge Portal (World Bank), temperatures in Guatemala are projected to increase (especially in the southern coast areas) between 1.5°C and 4.5°C, with temperatures exceeding 28°C in the month of May, much higher than average temperatures for that time of year. Moreover, a higher increase in average annual precipitation is expected near the Pacific Coast and in the Western and Central Plains, while a 30% reduction in precipitation in the Motagua Valley is likely in the east and in the central plains. **Indirectly, climate change will increase the incidence of pests and diseases, availability of nutrients in the soil, and will lead to increased propensity for fires.**

Moreover, the CCKP projects that by 2030 the reduction in the superficial water flow will be between 10 and 50% for some areas. This reduction in the water flow, along with the predicted temperature increases and precipitation reduction will result in lower water supply for population use, human development, and irrigation in agriculture (Waddick, 2017).

Finally, coastal ecosystems and communities will be affected by the global sea level rise, resulting in salinization, flooding, erosion and biodiversity loss.

BOX 3: HURRICANES IN GUATEMALA

In 2020, Guatemala, Honduras, Nicaragua and Costa Rica were hit by **Hurricanes Eta and Iota** that reached category 4 intensity, resulting in death and devastation. The hurricanes affected over 8 million people in Central America, and Guatemala, Honduras and Nicaragua were the worst-affected countries. In Guatemala, Eta and Iota afflicted 1.8 million people, damaged 164 448 hectares of cultivated land and caused the death of 126 812 livestock. Guatemala had to deal with the effects of Eta in 18 of its 22 departments, particularly the extensive damage to agriculture, livestock and rural livelihoods, which contributed to worsening the existing food insecurity (WMO Report, 2021; FAO, 2020).

“ Over there, we plant corn, sesame, and some people harvest watermelon, melon, cucumber, pawpaw tree fruit, others grow vegetables and a lot of different products that grow in the coastline, this is what we harvest, but as I was saying, droughts are not letting us receive enough amount of rain. The rainfall for water we need to be able to use for our own consumption and when it is possible, if there is some available, for trade. But now it is for our own consumption because there are not enough crops for commerce, the harvest is not enough. Now, sesame is definitely for commerce but it's the same problem, the production is not enough, the amount it's not enough, is not as it should be, whenever we have rain the crop doesn't require a lot of water so all the production it's being affected, we are expecting to receive the normal amount of rain for corn but then we are having too much water (precipitation) for the sesame, and it's affecting in both of our crops.”

Julio

Have you noticed any changes in the environment in your community in recent years?

“ Well, the change is very noticeable because winters have been very rare. Winter comes in late, sometimes it rains very hard, the water goes away fast. I don't know, it penetrates the earth so to speak, it goes very fast. It does not dampen. Disasters are created by landslides, for the same reason that it is heavily deforested. The human being is responsible for this. If the sun shines it is very strong. So yes, climate change is very noticeable.”

Maria

13.5 AGRICULTURE AND DEFORESTATION

Guatemala's economy continues to be largely based on agriculture which includes livestock, hunting, forestry, and fisheries sub-sectors. However, as reported by the majority of interviewees and confirmed by the literature review, over the past few decades **Guatemala is facing major rural environmental degradation, due, among other reasons, to the depletion and exploitation of natural resources, such as minerals, oil and hydro-power** (Bilsborrow and DeLargy 1990; Pedersen, 2014). This environmental deterioration is heavily determined by agricultural policies adopted by the government and by land use patterns. Indeed, the rapid and ongoing expansion of agro-industrial projects supported by the political authorities has

led to forced sales of small landholdings and to the evictions of small-scale farmers, mainly in the east and north of the country. Oil, African palm, coffee, banana, cardamom and sugarcane agribusiness are structural elements of the emerging "agrarian capitalism in Guatemala, which is defined here as a financialized and flexible type of agrarian extractivism" (Alonso Fredejas, 2015: 489). Raul Maas, director of the Instituto de Ambiente y Recursos Naturales (IARNA) from the Rafael Landívar University (URL) defined Guatemala as the new "world dessert industry" (Raul Maas, Director of the Institute of Environment and Natural Resources (IARNA) from the Rafael Landívar University).

“ *It is a mistake to disassociate the natural from the social. For me it is intrinsically intertwined and what occurs with (the exploitation) of natural resources is definitely going to have an impact on the population and its economy*”.

**Professor Sindy Marylin Hernández Bonilla
from the Institute for Research and Projection
on Global and Territorial Dynamics (IDGT)**

Indeed, the mono-cultural expansion is not only displacing indigenous and rural communities as well as basic food production (UNHRC, 2010), causing conflicts and social tensions, it is also

the leading cause of deforestation in the country, especially in the north of the country in the Peten region.

“ [...] *The biggest issue is deforestation. Deforestation is a big problem here. [...] The biggest deforestation that happens here is in order to plant pineapple*”.

Teresa

Reduction of trees is associated with a lower frequency of rains and, therefore, quantity of water available for crops and food production for small farmers that cannot compete with big industries

which, in their turn, use a huge amount of water stored in dams for irrigating their single-crop farming.

13.6 THE (MIS)MANAGEMENT OF NATURAL RESOURCES: EXACERBATING THE PROBLEM

The vulnerability of Guatemala is also due to the local **mismangement of resources** that intertwines with the effects of climate change both in rural and urban areas.



Bush fires in Totonicapán region, Guatemala⁴²

In urban areas major problems arise from the uncontrolled urbanisation and consequent accumulation of waste that limits adequate draining of water. However, those living in rural areas are the most affected. Indeed, deforestation and water scarcity are seriously affecting the population (Gleditsch et al. 2006, Brown and Funk 2008, Hanjra and Qureshi 2010), especially when combined with the expansion of monocultures by agroindustries, thus undermining food and, more in general, human security especially of indigenous people living in rural areas and that have less access to adaptation and mitigation strategies (Barnett and Adger, 2007).

“ Hence, “[t]here is a combination of natural phenomena but in the midst of significant environmental degradation and socio-economic conditions that make the population more vulnerable to all these events”.

Laura Hurtado, Guatemala Country Director for Action Aid

42. <https://www.hagomitarea.com/contenido/ciencias-sociales/departamentos/departamento-de-totonicapán/>

What do you think are the main causes of these [environmental] changes?

“ Well, there are many. One that I would blame is deforestation. The other is that businessmen have dedicated themselves to growing certain crops that deforest the areas, they do that to plant their crops, and that has also brought this change, because of the crops that are not from the area. I believe that climate change is coming to us. That is why it is so hot, sometimes it is very cold, or sometimes we have a lot of wind, but it is for the same reason that we have all been collaborating to make this happen. Winters are very rare, and as I repeat, sometimes when it rains, it rains so hard that the earth cannot absorb the water, it is as if it passed by”.

Maria

Have you noticed any changes in the environment in your community in recent years?

“ [...] It began in 2005, we began to suffer these small changes but in 2013 to this year it has been chaotic, because the change has been totally contaminated not only by the burning of the cane but also by the sprayed pesticides that they apply, Gramoxone⁴³, and Roundup⁴⁴, they apply it to the ripening of the cane and that causes many diseases, plus the scarcity of water. So, it causes an unhealthy environment, it is not healthy for human beings, so this has had a great change due to the immoderate cutting of trees and the institutions that have allowed it”.

Fernando

43. Paraquat is the active ingredient in Gramoxone, and has been banned in more than 50 countries, including the United Kingdom, China, Thailand and European Union nations. However, it's still widely used by farmers in many countries of the Global South, and in Australia and the United States

44. Roundup is banned in more than 20 countries because the herbicide has been linked to an increased risk of non-Hodgkin lymphoma and other types of cancer

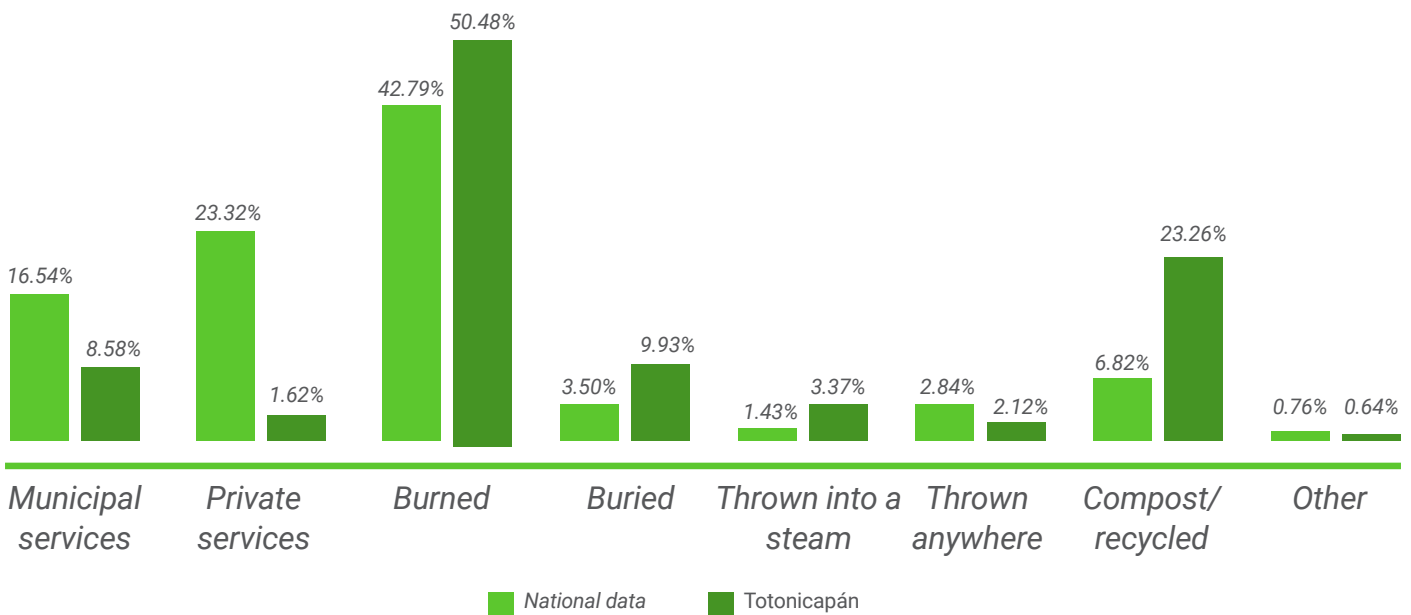


13.7 WATER AND WASTE

Waste disposal practices (see figure below) are not sustainable, since half of the population in Totonicapán burns their waste (50.48%), with a similar percentage at national level (42.79%). Only 10.2% of households use municipal or pri-

vate services but, in contrast with national data, in Totonicapán households compost and/or recycle waste more often (23.26% compared with a national average of 6,82%) (INE 2019).

WASTE DISPOSAL IN THE TOTONICAPÁN REGION



Many interviews and discussions in focus groups reported this attitude towards waste disposal as problematic:

“ It is very important to me to tell the people to take care of us and our environment, our lands such as garbage and waste disposal, this is what makes me feel so sad, sometimes you see people on the roads, I’ve seen vans with trash flying out the windows, that’s not fair, this land belongs to us and we should take care of it. That’s my recommendation to the people, please each of us take care of our garbage [...] we must keep our soils in a healthy state and try to avoid burning garbage.”

Julio

“ Another one is the trash collection service. In rural communities, wherever you go, there is no trash collection service. So everyone goes and burns their trash or they bury it or throw it away and that also contributes to the contamination of places, rivers that ends up harming the environment”.

Teresa

Indeed, the accumulation of waste may also exacerbate the impacts of irregular floods that are worsened by difficult drainage. The lack of sewage systems in many regions and the discharge

of waste into water bodies during floods present serious environmental and health risks. Local authorities are perceived as failing to educate people in good practice regarding waste management.

“ It draws my attention, because when we talk about the climate issue, we always say “people throw away garbage”, but it is not only about waste. I believe that we have not really become aware of consumerism, because we are the ones who take part of it and we are the ones who are not aware of the reality.”

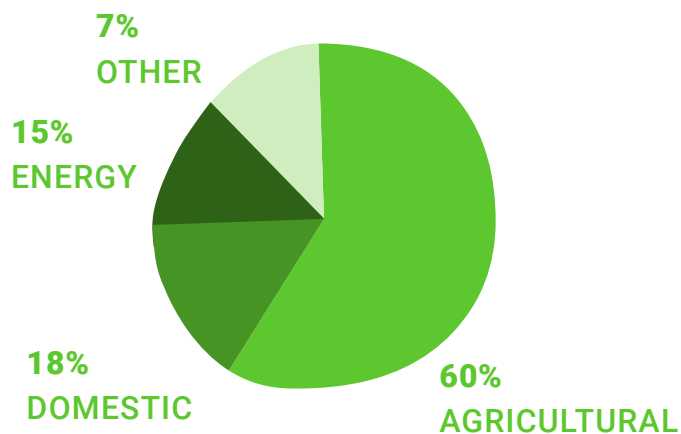
Focus group, Urban 1

In Guatemala around 58% of households have access to water through pipes within the house. At the same time, as reported above also, 27.5 % of survey respondents noted that their household suffered from insufficient quantities of drinking water during the previous 12 months. Severe drinking water shortages that the public authorities seem to be unable to resolve. Indeed, contamination and water shortages are also due to the mismanagement of untreated waste especially for superficial water, which is another relevant issue.

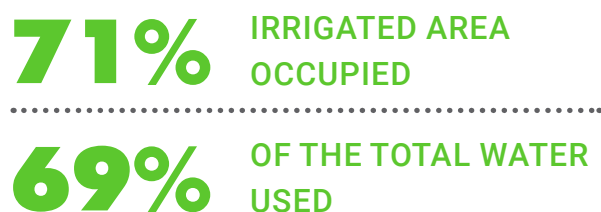
Basterrechea (2012) identifies agricultural and agroindustrial activities as one of the main sources of water contamination with 47% of the contaminated water deriving from these activities. At the same time, it is estimated that 40% of water for domestic use is contaminating superficial waters (Basterrechea 2012). Export crops from agroindustry - **sugar cane, palm oil and banana** - together occupy 71% of the total irrigated area using 69% of the total amount of water for irrigation (Solano Garrido and Ochoa 2019).

Water resources in Guatemala are used mainly for agricultural activities (59.5%), domestic use (18.0%) and energy production (15.4%) (MARN, 2016).

USE OF WATER RESOURCES:



SUGAR CANE, PALM OIL AND BANANA



The excessive use of water is causing river deviation, crop losses, and damaging artisanal fishing, while communities remain without access to water; furthermore, local communities are subject to illegal and legal land dispossession (PNUD 2016) reflecting a general resource mismanagement. In addition to agricultural activities, the expansion of the mining industry has increased the consumption of water, posing several **water management challenges**, including potential impacts on surrounding aquifers and their water users.

Hence, the small farmers in rural areas experience scarcity of water and thus soil dryness, due to the lack of appropriate water supply management. The situation is exacerbated by the ongoing expansion of the Dry Corridor, while other parts of the country are affected by serious events, like the Eta and Iota hurricanes in 2020.

Political authorities at both national and local level fail to carry out effective actions and or make commitments to adequately manage natural resources.

On the contrary, granting of licences and permissions for the exploitation of natural resources and lands continues. In addition, participants perceive that neither local authorities nor individuals and households are prepared for extreme events, both in relation to the response and the recovery phase.

Previous harmonious interaction with land and water has been overridden by harmful agroindustry practices polluting the environment.

And how do you think climate change has affected your community, your livelihoods?

“ *It is affected in many ways because water is becoming scarce for the same reason that it rains less. And the crops no longer exist for the same reason, we no longer know if it is going to rain or when it is going to rain, and if it rains a lot, it damages the crops. It hardly happens anymore, what we plant here is corn, beans and other people are dedicated to planting tomatoes. We want to take care of it and we have to protect it from very strong water. If it doesn't rain, we have to water it. All that causes more expense. Yes, the lack of water has been very noticeable because we have less water to consume, for expenses; and the planting is no longer cultivated the same way. And we live from it, which is what we have to sustain ourselves, agriculture, which is no longer sustainable. Because very little is given and much is invested. That is why many people already have to migrate, for the very reason that we have nothing, there is no reason to survive here”.*

Maria

“ *I see that the agroindustry ended up with everything, first of all, it dried up rivers, dried the phreatic level, and caused deforestation, also the mangrove swamp degradation and its destruction it affects the water filtering and the level of the saltwater is flooding more and more because the destruction of the mangrove forest. All of this is causing more droughts”.*

Victoria

“ *The Mucbilhá river ... is being threatened because of the large plantations of palm and oil, and other monocultures that are reducing the flow of the rivers. The community of Mucbilhá⁴⁵ has maintained the river, the forest, and nature! Because it is alive. The web of life begins there, people, animals, mountains, stones; we make this complementarity: the human being is nothing without nature. Is nothing. So, that's why we say that it is logical to understand nature the way our communities understand it, we are nature, we are one life, nothing more. So it is necessary to defend it, take care of it, protect it, because if we don't, every time we are running out of water, there will be a shortage of it. In other communities, there is practically no water.”*

Fernando

45. Mucbilhá is situated in the southeast of Sechaj, Alta Verapaz Department.

Do you know of any other local or municipal initiative that seeks to reduce these effects of climate change?

“ Well, we have held a meeting with the current mayor and the truth is that he is not really interested in how to improve climate change. We have a process between the Council of Communities, we have made a water harvester, because we capture rainwater, we retain forty-two thousand or forty-three thousand litres of water that is used to irrigate two rows of land; and it works well for families who do not have water. They can use it to wash dishes and daily consumption. The families have chilli, tomato, green bean, squash and everything is organic but we have kept one because the costs are also high, approximately fifteen thousand or seventeen thousand quetzals. We got the money through community collections.

We demand a healthy environment from the state authorities and we also want to plant trees and we are proposing alternative solutions to survive, because during the winter, water can be collected and we could irrigate crops to help families. We invited the mayor to go see the project but he was not interested, the government is not really interested, they are interested in continuing to give licences and permissions for exploitation. They [The Governors] continue to plant more sugarcane in the territory of Champerico⁴⁶. They are not really interested in human life, what they are interested in is that the sugarcane comes out, period. They do not see if there are other needs, therefore, we have been able to survive on our own. We have organised ourselves because there is really no government institution that supports us.

Banks come to our community to offer credit, but they offer it to you with high interest rates and their intention is to give you a debt that you will not be able to get out of, and the same industry is buying these lands; So we think that it is the government's strategy, to send bank agents together with the sugarcane plant to get us out of our communities, from our roots, so we have told the communities that they shouldn't accept any loans and it is better to work with God's will. We have been able to stop this type of indebtedness. Sometimes what they do is send people to burn our harvest. It is what I have experienced first-hand, two harvests from which I could not get even five quetzals (0,59 euros) of what I invested, last year they burned all the sesame seeds. So we have had that political persecution and intimidation that this type of industry does”.

Fernando

46. Champerico is a town and municipality in the Retalhuleu Department in southwestern of Guatemala. It is strategically important for the production of coffee, timber, and above all sugar. In recent times, there has been an exponential increase in sugarcane cultivation and Champerico represents one of the municipalities in which the majority of the arable land is dedicated to the cultivation of sugarcane. In 2016, the population endorsed the Declaration of Champerico by demanding the recovery of the river basins, reparations for the damage caused to the environment and the people, and the transformation from an agricultural model of exportation to a model of food sovereignty, which would place respect and recognition for indigenous identity at the centre.

BOX 4: VIOLENCE AGAINST ENVIRONMENTAL ACTIVISTS AND HUMAN RIGHTS DEFENDERS

The situation of human rights defenders in Guatemala has been a source of constant concern for the Inter-American Commission for Human Rights (IACHR) due to the acts of violence and aggression to which they are constantly exposed, ranging from murders, to repeated threats, harassment and criminalization. Criminalization and persecution against people who oppose the government (IACHR 2017) are visible nowadays, in particular for Maya organisations and human rights activists protesting development projects (IDCM 2018) and land rights (Frost 2016). Indeed, human rights and environmental protection are often interlinked and land disputes and environmental damage are two of the prominent underlying causes behind communities' activism. For instance, in southwestern Guatemala, the Comisión Paz y Ecología (Peace and Ecology Commission, or COPAE) is helping Indigenous peoples push back against the exploitation of their land by mining companies.

Guatemala is among the most dangerous countries for environmental human rights defenders (EHDRs). Although murders against human rights defenders in general have decreased, violence is not diminishing, particularly against land and indigenous right defenders and journalists. In 2018, the Guatemalan Union of Human Rights Defenders tallied over 200 attacks against human rights defenders in Guatemala. In 2020 alone, Guatemala registered 13 documented killings among environmental activists (Global Witness Foundation Report, 2021). Moreover, attacks against women human rights defenders, resulting in gender-specific threats including sexual violence, have grown in recent years (Hernández Bonilla and Morales Orellana 2020).

Despite these apparent efforts, the majority of the interviewees agreed on the lack of a long-term and holistic vision on the future of the country from the (past and present) government. Moreover, the majority of the interviewees pointed out the lack of policies on major national issues such as climate change; water usage and deforestation; structure policies against monocultures; and prevention. As already anticipated, national policies result in ineffective implementation. The Regional Thematic Specialist for the Americas and the Caribbean for the IOM MECC pointed out that "(IOM) engagement with the government has been quite limited, partly also because of political turnover [...].

The introduction of MECC in the national climate change strategy shows positive progress but requires sustained action" (Regional Thematic Specialist IOM-Migration, Environment and Climate Change (MECC)).

Alongside the lack of effective preparedness and response instruments, there is another level of analysis to be added: "Here, natural events more easily become a disaster, because we do not have prevention policies" (Professor Sindy Marilyn Hernández Bonilla, from the Institute for Research and Projection on Global and Territorial Dynamics (IDGT)).

“ [...] in the country we have serious difficulties in addressing the national structural problems. Aspects that have to do with equal access to natural resources, aspects related to the improvement of living conditions (poverty, inequality, health, education, livelihoods, water resources). When, as in Guatemala, a country has social precariousness and vulnerability, connected with a long history of public policies that do not prevent certain economic sectors from massive agro-export, global elements impact with greater pressure”.

**Professor Sindy Marylin Hernández Bonilla,
from the Institute for Research and
Projection on Global and Territorial Dynamics (IDGT)**

It is not surprising, then, that, according to some interviewees, “the State of Guatemala is responsible and the State of Guatemala and Guatemalan officials have been part of that climate change” (Fernando, 32, Farmer); “They are the main bodies responsible because they would have to find the means of how not to deforest, how to educate us” (Maria, 53, Housewife, Farmer, Activist). At the same time, interviewees also underlined the critical role of “big countries” and, especially, of the United States: “I do not have much knowledge, but I would blame the United States, which gives but takes away. Because the US has mining com-

panies that have come to destroy Guatemala” (Maria, 53, Housewife, Farmer, Activist). Ultimately, while individuals are partially responsible when acting in their daily life without full awareness and education (“People have lost consciousness” (Maria, 53, Housewife, Farmer, Activist)), major responsibility for environmental degradation and climate change is attributed to the national government and third countries in following the interests of big (sometimes foreign) companies, facilitating a corrupt system, failing to adequately educate people and proposing a limited preventive approach.

Do you believe that the Guatemalan State is also responsible for climate change?

“ Yes, it is also responsible. The political system was bought ... and the state was bought by a few families. They are guilty and they are the ones causing the problem, that is why we are in this situation right now. Because the President and the state support the companies that are affecting us, they are linked with the companies, they do not care about the people in the villages, their priority is the companies. We recently had a meeting where people realised that the Guatemalan government is sending the fertiliser to the palm companies and it is not to support peasants or farmers but for the companies. [...]”

Victoria

Do you consider that other countries apart from Guatemala create this change in the climate, this global warming? Do you think there are other countries that are also responsible?

“ Yes, there are other countries that support these companies, the companies have contact with them and they cover almost the entire country. Countries such as the United States, the U.S. President is allied with our President; The president of the United States gives loans to the Guatemala President, therefore he agrees with the palm planting, that is why they are also guilty, perhaps not the whole country, only some people, there are some characters who are involved; sometimes we blame the country but there are only specific people who are guilty. In other countries where energy is sent, it does not provide energy here in our country but they send it to other countries and those countries support those companies, which is why they are guilty of what has happened to us”.

Victoria



13.8 HUMAN MOBILITY IN GUATEMALA: PATTERNS AND TRENDS

Could you tell me about human mobility or the migration flow of the people in the community?

“ [...] The Congress could pass laws to protect migrants who are in other countries helping Guatemala, so that they could feel protected by the laws of Guatemala wherever they are. And also when I hear the word migration, something that comes to mind is not just going to the US, the American Dream, but also me, for example, I am a result of the migration I had to endure moving from two places, you could say. From Petén to Santa Rosa, and from Santa Rosa to here, where I live. All because I didn't own land, right, where to live, where to settle.

And because of work. And a lack of work causes migration every day, from department to department. There are those who go to harvest, for example, people from my community, who go to harvest in the cold areas. Right after the harvest, all the people are brought back in a truck. They come to get them and 8 days later they come to drop them off. So in the end that is migration. Because we don't have the opportunities to find a job. Everybody here in the community, most people, 12% maybe, no, I might be exaggerating, 6% of the people have a steady job at a company. And then the rest of us are informal workers who work in agriculture. And agriculture makes us migrate to different departments, you know. So, the word migration is like going back to the past and remembering all the bitter moments that you have to go through, because of inequality and lack of opportunities”.

“ When I hear the word migration, I hear sadness. I think of sadness, loneliness, broken families, death... In Guatemala, one of the most difficult processes is migration, you know. And I think that not even Guatemala is prepared to deal with its migrants.”

Teresa

Guatemala is a country characterised by many types of migration patterns. Migration is mostly related to poverty, deprivation, lack of quality educational opportunities, health concerns and food insecurity (connected with climate change), gang- and State-related violence. Poverty and unemployment are indicated as the most common reasons for internal and international migration, meaning that those who migrate often belong to the most vulnerable categories. Whether mi-

gration is a sign of vulnerability or an adaptation strategy is context specific, and there is no gender or age-related specific connotation: “Women and men and young women, young people and adults, there is no age to migrate” (Maria - 53, Housewife, Farmer, Activist); “ So in the end that is migration; migration is focused on young people, girls, women and even adults because they no longer have the means to feed themselves or to work and they decide to migrate” (Fernando - 32, Farmer).

BOX 5: COMMUNICATING MIGRATION

Migration in Central America was the focus of international media attention with the so-called ‘migrant caravan’ which began in Honduras in October 2018 when thousands of migrants, many of them children, from Central America – especially El Salvador, Guatemala, Nicaragua and Honduras – trekked for thousands of miles toward the Mexico–United States border. Both Guatemalan nationals and international migrants transiting through Guatemala towards the US border have historically heavily relied on smuggling, locally known as “Coyoterismo”, to reach their final destinations often financed by debts with low regulated or illegal financial institutions. During these unauthorised journeys women are at greater risk of sexual assault and violence.

“ We cannot go out in groups either, but if the situation in Guatemala does not improve, we are going to become a country like Honduras where we are going to have to go out in a *caravan*.”

Fernando (32, Farmer)

As for the nature of the migration patterns, literature and interviews highlight how the largest movements are internal from rural-to-rural communities: people may move permanently or temporarily (for seasonal jobs, as in coffee or sugar plantations). The mono-culture production forces seasonal internal migration, mostly of indigenous people. As confirmed by Laura Hurtado, director of ActionAid Guatemala: “[...] People are forced to migrate in areas that are already hit by poverty for reasons of land grabbing, dispossession, floods or landslides. The most economically depressed communities and workers migrate internally and are the workforce on mono-culture plantations. For example, we have been observing increased migrations from the Izabal area or several municipalities of Verapaz to El Petén which are the labour force for the collection of African palms, or to the Costa Sur for the collection of bananas”. Notwithstanding the country’s agricultural roots and a high majority of indigenous living in rural areas, nowadays the majority of the population lives

in urban centres, with almost 3 million (1/5 of the total population) living in Guatemala City (World Bank, 2017). In effect, as pointed out during an interview “young people have less and less interest in agricultural activity” (Professor Sindy Marilyn Hernández Bonilla, Instituto de Investigación y Proyección sobre Dinámicas Globales y Territoriales (IDGT)). Instead, young people are increasingly attracted to the American dream and the imaginaries of life as seen in movies that create different aspirations also in terms of personal development. This is leading to increased migration to Guatemala City. Following the global trends of urbanisation, the urban communities of the country increased from 31% (1960) to 51,8% (2020) of the total population (World Bank, 2017). Generally, migration featured more heavily in discussions in the urban focus groups and interviews than in the rural ones. Interviewees confirmed that migration may also be two-step: from rural to urban and then from urban to international countries.

How has climate change influenced people's desire to migrate?

“ Yes, they are forced to leave their communities to Guatemala City to look for a job there and to other countries, mainly to the United States. That it has been a country that has provided support to many migrants, but things have become difficult lately to get there. So that [migration] has helped the communities in a way because only what we have here is no longer enough to survive. It would be a lie if I told you, I would be as I am right now, if there was not someone who had migrated there. Because, unfortunately, it is already difficult to survive here or we have to migrate to the city, find a job there, even if it is for a miserable payment and those who cannot find it in the city, have to look for other options.”

Maria

Cross-border migration is mainly to Southern Mexico, in the form of temporary agricultural migrants for low-wage jobs, and to the United States, indicated as the most desirable international destination.

Considering the geographical proximity of the two countries, migration to the United States consti-

tutes a significant social and economic phenomenon over the past 30 years⁴⁷. Adults still constitute the majority of emigrants (around 80% of men and 20% of women), but the proportion of accompanied and unaccompanied children has increased in recent years. Juan José Hurtado Paz y Paz, director of an association working with indigenous communities reported how:

“ Men have been migrating from the Chichicapa community (Huehuetenango) for the past 15 years, when we (my organisation) visited out of 37 households that we visited only 2 had adult men. Instead, the households were composed of the elderly, women and children. Because the men had emigrated to the US.”

Maria

From a historical-structural approach (World System Theory of Wallerstein), Guatemalan migration to the United States represents a transfer of labour from peripheral to core regions of the global capitalist economy (Scarnato 2018; Moran-Taylor 2009). Guatemalan migration to the US, reveals

structural patterns affecting moments of transformation and change over the years due mainly to macro (the bilateral relations of the two countries and the regional (in)stability), meso (networks) and micro factors. As pointed out during the interviews:

“ People mainly leave [for the US] because they have networks that have been built over years.”

**Professor Sindy Marylin Hernández Bonilla,
from the Institute for Research and
Projection on Global and Territorial Dynamics (IDGT)**

47. According to IOM, in 2016 the annual remittances to Guatemala reached USD 7.27 billion, 97.1 percent as remittances from people living in the United States (IOM, Guatemala Remittances - 97 Percent from USA: IOM Study, 17 February 2017). In 2020, remittances increased by 7.9 percent and were equivalent to 14.6 percent of GDP. See, 2021 Investment Climate Statements: Guatemala, <https://www.state.gov/reports/2021-investment-climate-statements/guatemala/>

However, since there is currently no agreement between Guatemala and the United States regulating migration, most of those fleeing towards the US have irregular status.

Successful migration, while often perceived as something negative that brings disruption of family ties, can become a source of support for family members who stay behind. Interviewees confirmed the important role of **remittances** for families and the economy of Guatemala overall. However, since 2004 Guatemala has seen a steady number of Guatemalans being forcibly

returned from other countries. According to the IOM, migrants that are forced to return face myriad difficulties and obstacles to their successful reintegration, such as limited economic opportunities and lack of access to social services and credit. The failed debt-financed migration attempt might increase the necessity and desire to attempt a new journey. Families that experience multiple migration attempts by a member are likely to worsen their condition with each new attempt, given the high emigration costs, falling into a crushing cycle of migration and deportation.

“ That is what the government is not paying attention to, the government says to not go there but they are expecting the remittance income to the country, why? they are getting a benefit from this. Our relatives that are sending money from the States are paying more taxes than the agroindustries that are here in the country, they don't pay taxes, if they paid taxes we could have roads in a good state, good projects for our communities, but now, everything it's being stolen by the government and this is a shame, everything is a chain, everything that we look at, for example, global warming, the issue of migration as well.”

Julio



13.9 INTERTWINING ENVIRONMENT, CLIMATE CHANGE AND MIGRATION

The majority of the interviewees identified an “environmental migrant” as a person moving internally from rural-to-rural areas of the country “looking for better job and life opportunities” (Luis Rodriguez, Founder and Director of GuateAmbiente). In Guatemala, “climate change intensifies already existing migration flows” (Laura Hurtado, Guatemala Country Director for Action Aid). In this sense, **climate change** aggravates other structur-

al national factors, such as poverty, and acts as a **vulnerability multiplier**. Climate change is not identified as an explicit driver of migration but rather as an element that influences the individual desire to migrate. Indeed, the idea is that when soil is no longer fertile or crops fail, people look for better working opportunities and income sources and, hence, are forced to migrate, as happened in the Cuchupan community (in Champerico).

“ [...] The land doesn't produce the same way, it produces less... because it is not possible to grow plants, it is not fertile... Because there is no land where to grow plants anymore...a lot of people go away because they see that there is no opportunity in our lands anymore. It is like they see that, if they sow, for example, carrots, other kinds of vegetables... They see that it is like the land doesn't grow those plants, and also there is not enough water to irrigate certain plants. Then, for that same reason, they seek other opportunities outside the country. If it wasn't like that, if there was... as in years before... that we would have a really green environment, really healthy. I think that also because people from here, from our community, work in agriculture. I think that more than one wouldn't have gone if the soil bears fruit, but nowadays it rarely does anymore. I mean, it is like the degradation of the environment.”

Focus Group, Rural 1

In Guatemala, there are many people considering migration as a vulnerability mitigation strategy. Climatic shocks like floods can also act as a trigger for the decision to move. Additionally, interviewees highlighted a strong

connection between indigenous communities, climate change and migration. Indigenous people face disproportionate impacts as a result of climate change in comparison to nonindigenous people.

“ We have to say that they can have access to special international protection for these reasons, right. And humanitarian assistance first. But we need to relocate these villages that are being affected and cannot return to their lands. I have no idea what the government is going to do with the towns, for example, in the case of the communities in Alta Verapaz, right. Because as far as I remember, they are returning to their territories. They waited for the floods to go down and returned to their own land.”

Luisa

As a result of the mono-cultural expansion and the upsurge in (metal) mining activity (van de Sandt, 2009), indigenous communities have experienced an increase in land exploitation over the past few decades. In a vicious circle, these activities have contributed to environmental deterioration, which has accelerated and fostered climate change, which has strong negative social and environmental impacts on indigenous communities and territories. As a result, the mainly indigenous populations living in rural areas find themselves forced to migrate.

Why are there people who have decided to go to the United States or elsewhere?

“ Because you don't earn money, but we also have mismanagement of funds; I don't mean that with little money you can't live. The reason is poor management of the little you have. And the other thing, on the other hand, less than half are the ones that... can get jobs at the palm company. The rest of the people don't have a job and that's why not only day labourers, but also temporary people are leaving. The government doesn't give a contract, it doesn't hire people. For example, I have a son who went there, he got his bachelor's degree in Pedagogy, but never had the opportunity to... only here we were paying, not a lot of money that we paid him because... as a professional, he already wants to earn more; that's why he decided to go there, but the truth is that there isn't any land anymore, so the mentality of those who go there is that they're going to get more money to buy some land here, that's why they're going there, but some are going to be able to do it and others are going to stay the same.”

Javier

And do you think this lack of water, the drought... were a determinant factor for him to decide to leave?

“ Well, yes. Yes, because when summer comes everything dries up, you can see that everything... no longer has life; because water is the life of all plants, of all animals, since you can no longer breed animals, you can no longer sow things that do really generate money; that is why it is also a problem now that water... all the water that appears is contaminated. Because of all the chemicals they use on the soil, the poison, fungicides and all that. And here most people... it's just bought water what they drink, it's no longer about going to get water. That's why it's also hard to live, we already had to create wells, but we need funds to do all that.”

Javier

In a vicious circle, people escaping from environmental disaster (and poverty) looking for better living standards are causing even more environmental problems, including rapid urbanisation, soil erosion, abandonment of rural areas, declining health and physical resilience, and consequently negative effects on source and destination communities and ecosystems. Indeed, rural to urban migration is causing health and environmental problems, due to overpopulation in certain areas. Guatemala City's uncontrolled and rapid pace of growth is leading to increased water and air pollution and mismanagement of waste disposal. Given the intertwining of environmental and eco-

conomic issues, individuals do not acknowledge the need to establish an international instrument of legal protection. Rather, interviews reveal the different approaches of activists and local people. The formers are more prone to ask for the introduction (or an extension) of the asylum formula in favour of those migrating owing to the worsening of environmental conditions; the latter mostly rely on the national government as the primary body responsible for the life of its citizens and, maintain that at a minimum, third countries should guarantee greater regular mobility options in order to allow safe and secure migration.

Do you think that other countries should recognize special or international protection for people who have to leave their home, their life, their community due to this type of problem caused by climate change?

“ *They should have a shelter or an asylum. They should give asylum to people who travel to other countries because they are responsible for it and as humans, we have that right and we can't be denied that right. [...]; But if we, Guatemalans, want to go to other countries, they do not receive us, they deny the entry, that is why other presidents of the country should have that protection because we are human and we have life and life is a right.*”

Victoria

And the people who had to leave because there was a fire or a flooding, and they lost their house. These people who lose everything and leave, do you think they should get protection, too?

“ *Yes, that's what I'm saying, that these people need to be protected. Because I did also have the opportunity to be in some parts of Coban and Salama and seeing everything that happened with Eta and Iota, I see that it is also a great responsibility of the government to find a way... to help them.*”

Juan

THEMES EMERGING FROM THE RESEARCH

- Intertwining of environmental degradation and climate crisis:
 - Deforestation, inefficient waste management and water scarcity are the main issues identified with environmental degradation
 - Flourishing of monocultures (sugar cane, palm oil industry) by agroindustries cultivated for export, and lack of political actions and commitment, especially at the local level, are considered as aggravating factors and among the main reasons for environmental degradation
 - Uncontrolled urbanisation
 - Rainfall variability (both floods and droughts) are identified as major concerns regarding climate change
- Waste management issues
- Water shortages - both drinking water and for agriculture
- Pollution of land and water from large (poorly regulated) industries
- Responsibility for climate change is attributed to the national government predominantly owing to it following the interests of big (sometimes foreign) companies and in facilitating a corrupt system
- Individuals are responsible when acting in their daily life without full awareness and education
- Consequences:
 - Decrease in crops/food production for small farmers
 - Perception of not being prepared at all for coping with sudden events
- Migration is mainly due to economic reasons/better life opportunities/lack of jobs. Climate change is not perceived as an autonomous driver of migration, but as a one element influencing individual desire.

14. CONCLUSIONS AND SOLUTIONS

Climate change increases unpredictability in weather patterns leading to **climate variability** resulting in irregular rain-patterns and extreme events (especially heat waves and floods) which impacts weather-dependent livelihoods.

Guatemala is also suffering from rural environmental degradation, for a number of reasons, including the depletion and **exploitation of natural resources**, especially due to mono-cultural expansion and deforestation. Mismanagement of natural resources was perceived as a relevant contributing factor to environmental degradation, which intersects with the lack, or poor implementation, of policies. Results reported how most environmental migration is **internal** and predominantly **rural populations**: people may permanently or temporarily (for seasonal jobs, as in coffee or sugar plantations). 'Environmental migrants' are principally identified with rural and indigenous populations, due primarily to lack of social and economic equality and poor infrastructures. During the interviews, some drivers emerged as more prominent in influencing migration: economic (food and livelihood insecurity, income and credit access) and socio-cultural (personal aspirations and characteristics like age, gender, ethnicity, skills and education) ones.

The role of the supranational context (especially the bilateral relations with Mexico and USA), as well as the patterns that have historically characterised migration flows were highlighted as (non) facilitating factors of mobility. Interviewees confirmed that migration is not usually linear but rather may be a **two-step process**: from rural to urban and then from urban and, eventually but less often, to third countries, in particular Mexico and USA.

To cope with these challenges, interviewees encouraged improved environmental knowledge and improved community engagement around the protection of the environment. They also ask for better implementation of laws on water, waste disposal and land usage, in particular for mono-culture cultivation to avoid exploitative practices. In general, to meet the SDGs, they suggested promoting equal development, understood as improving the coping, mitigation and adaptation strategies put in place by populations experiencing climate change impacts.

15. APPENDIX: EXTRACTS FROM INTERVIEWS

VICTORIA (26, HUMAN RIGHTS DEFENDER)

“**And the causes of why people have decided to migrate, do you manage to know them?**

They visualized themselves there, people tell us when they have arrived there with us in the offices. As you have said eh ... the climatic changes and the changes that have arisen and at this point we know well that the countries, that the presidents do not care, let's say eh ... There have been cases that have migrated because they have nowhere to live, they have nowhere to build their houses.

The palm and rubber companies that have taken over a lot of land and some people who sold their land under deceit and there are also some who have found it necessary to cede the land to the entrepreneurs, because they really can no longer pass or no longer they have that freedom to pass on their grounds. They see themselves as obliged to sell their land to them, because they have their strategy or mechanics that if they bought one land that is central the lands that are next to it are closed, forcing people to sell the lands because they cannot access anymore. That is one of the issues; there are mothers who have stayed with their children and their husbands due to the same situation that we also have in our country. They haven't given us the attention, the education, having a decent life or a home; We do not have a good life, we do not have something with which we are prepared academically. All education is privatized, one has to pay, so young people, ladies and girls have migrated to other countries in search of a better future. And some of them realize that either they feel happy or have a different lifestyle, they have forgotten their families; there are also some who have travelled that we do not know where they are, that we do not know what happened to them, they have disappeared along the way. There are mothers who travel pregnant; there are mothers who travel in search of their children or their husbands who despair in this country and we have many cases, of young people who go in search of their fathers; there are entire families

who have travelled; either the husband travelled first or the wife travelled and brought their children and there has been family disintegration, for the same reason sometimes the rest of the family forces someone to travel to find those who are already there.

And when you say “there” ... where are we talking about? what country? Where do people mainly go?

In the United States, there are also internal and external migrations, people from villages who have come to work here in Guatemala City, where we are located right now; eh ... There have been young graduates at some point that don't get a job there, because the U.S. says that they need to have three years of experience as a minimum. The young people say “how are we going to get the experience if they don't give us a job in the first place”. There are cases that happened this year in Ixcán, that three young people lost their lives. Why? because they came here in search of work, but unfortunately, they have lost their lives in search of work. They came in search of a better life, but unfortunately in our country these cases are not seen or are not made visible, they came to work in order for them to have an economic income, but they have met death. That is something that we have also been fighting and we have been in this constant struggle because they are and I am as well, from a youth organization group called Akmolam which is in our mother tongue Q'eqch'í which means New Generation; these young people have participated in that, but unfortunately we have lost them, those young people have marked us, they have left us feeling empty because we knew them, we lived with them; they wanted something else, they came in search of a better job because they don't have it in our area or in our territory, so they have to look for it somewhere else.

Do you know any people who have had to leave after these disasters?

We do. I know cases of people who have left and also people that want to leave now, some because there is no corn as I said, there is not. Perhaps there are some who have their own means to buy it, but right now the price is increasing with the little corn that is left, now it is worth twice as much. If corn used to cost a hundred, now two hundred, even two hundred and fifty. This is how the system handles us, they have bought and they are selling it, they earn double; If we don't have the money or we no longer have a place to grow it, how are we going to eat? As people have to and, in our territory, there are families that have seven, ten children so those children want to eat, they want clothing and they want an education, that is why people decide to go there, they decide to travel north to feed their families. They think the solution is there; and since I also have testimonies of people who live in the United States and it is not the same as living here, because they are locked up and cannot leave, they have another culture, another lifestyle and there are people who are around them, that they don't know and don't speak to them. They live in fear that one day they will be deported or sent back to the country, there are many cases of migration due to climate change and we are suffering.

One does not know or has not written what might happen during the day, there are some who have lost their foot, their hand, their sight, even their lives or are missing and we do not know where they are located. It is another question, if here they flee from a problem, the problem there is another, it is double or it is much more dangerous and that is why I would say that we are obligated, it is not that we want to migrate, but what we really want is to solve the problem and be able to eat.

How do you think or how much impact do you think this will have in the future? How does the future look in Ixcán, how do you think these effects of disasters or storms will affect the community?

We are already seeing that we will be suffering in the future as well. I believe that more problems will come and if we do not stop or have con-

sciousness; we will lose everything. Some people are aware of what is happening; but others aren't, they don't care, they don't have conscience, they don't think about the future .. Based on the current situation, this will increase the problems, because we have already lost ground... people are looking for solutions or the same system is implementing more strategies to be able to take away the little land we have left and then in the future it will affect us more. If we do not fight or defend ourselves, they could win the battle. We fight against some institutions, we also know that not all institutions have the same interest, what we want is for people to see, for people to realize that what we want to do is reflect the situation with facts and raise awareness. What we want to do right now, is for people to see with their own eyes their own reality or the harsh reality that we live in, perhaps through these interviews or by other means, we could set up a theatre or we can do things like that so that people see, because talking to people and telling them that in the future it will affect us, wouldn't work, but maybe acting or looking for strategies and tools that help us replicate or reflect the problem might help people see what it's actually happening.

May I ask you a personal question? Have you ever thought about migrating or leaving your community?

Well, in one occasion I did think about doing it because there are friends who influence or people who tell you how beautiful it is and then on some occasion a friend told me that I could travel. After I had that training [at the Oficina de Atención al Migrante en Ixcán], they told us the causes, the consequences, so I started to think and analyse and I thought "no, I have everything here and I can solve it here." I wanted to improve myself and I wanted to study because I had stayed with a medium level education and could not continue in university and then I said: "If I go there, I have to study and see what to do", then I talked to my family, and they said no. I have family members that have travelled and are there; but they did not have freedom ... It is another culture, other language, they use another clothing and you are going to adopt a culture that is not yours, live with other families

that are not your own blood or adapt to that, so you might feel lonely and begin to experience or begin to ingest perhaps alcohol, drugs, so these are situations that you can experience. Because you are far away from your family. I could say that thanks to the training I did not leave, and I wanted to go also for the simple fact of visiting but then I

saw the whole situation and knew that here I can live and I can get ahead as long as I want, so I decided not to go, until now I think I wouldn't. There have been many friends who said they were going to support me but I thought that with this situation I don't want to go, I can't leave my family".

FERNANDO (32, FARMER)

“ Let's start. First by asking you about the environment in your community and if you could tell me if you have seen any changes in recent years in the environment

We arrived in Champerico in 1998, in those years the environment was very healthy, because Champerico had more cattle production ... It was dedicated to cattle ranching and that allowed rivers, streams, births, life was a little healthier.

In 2005, well Champerico itself was invaded by monocultures, specifically, sugar cane industries, where they completely cut down all the trees, all kinds of trees, trees that were 50, 60, 70 years old were felled since then the environment changed, the rains changed a lot ... the rivers dried up. It could no longer be produced because the communities had a production; At least in my community they had a production of melon, watermelon, papaya, chili, tomato, and several vegetables that went to the market because there was water to irrigate. But from 2005 to 2013 the situation worsened. It began in 2005, we began to suffer these small changes but in 2013 to this year it has been chaotic, because the change has been totally contaminated not only by the burning of the cane but also by the aerial expressions that they apply, Gramoxone, Diclofaco and Random, they apply it to the ripening of the cane and that causes many diseases, plus the scarcity of water; So it causes an unhealthy environment, it is not healthy for human beings, so this has had a great change due to the immoderate cutting of trees and the institutions that have allowed it.

Could you describe to me with your own words, what climate change is? What does it mean?

They have explained to us that climate change is created by people, but I don't understand climate change itself. In the end, we as human beings do not make climate change, it is done by the agroindustry that are cutting down the trees. Champerico had frequent winters, it rained a lot, today it no longer rains because there is no trees, the rivers do not reach the sea and if the river does not reach the sea, it does not act as rain because the clouds collect rain; specifically those who are entrepreneurs are dedicated to create money out of them; we do not understand what climate change is, but it exists because of the agribusinesses that are directly cutting down everything in their path.

What kind of impact do these changes have generated in the community?

Well, one of the impacts they have generated is that food is no longer produced; in other words, the sowing no longer occurs, winters are as if they were summers, we know them as dry winters because it does not rain when it's May. For example, previously in my community they sowed on May 10th, everyone sewed on May 10th, today we have had sown time until the end of June because that is when it rains; so the winters are dry, that means that all of us who produce lose because sometimes it rains only at the beginning of June and it rains only because a hurricane passes or a storm passes; after the storm we wait 15, 20, even 40 days and it doesn't really rain. Champerico during

the first year in 2019 lost 95% of its harvest because it did not rain; Cassava, green beans, sweet potatoes, corn were lost and this meant that malnutrition for children grew. There is a recent study that indicates that each community has 35 to 25 children with malnutrition that the state does not want to recognize because it does not suit them.

In which way do these losses affect the population's ability to survive?

They affect in the way that as peasants we work either with our own resources or with a loan paying interest and that means that people will have money when they lose their harvest. People lose their land and they migrate elsewhere and we do not have the State aid to help us and guide the farmer on how to generate or seek other alternatives to be able to cultivate. Each person uses his own resources or God helps them so that they can cultivate corn and some products that are for the market of the municipalities.

How much impact do you think these changes will have on the community's life in the future?

Well look, in the future we will have what we are already experiencing. I think that what awaits us is to migrate to another place because definitely nothing good is waiting for us; We have been losing a lot all these years and most of them are already trying to migrate. Migrations have been very strong these days, years ago it was not that much but in recent years too many families have definitely migrated, too many young people and girls because, well, we have no other choice.

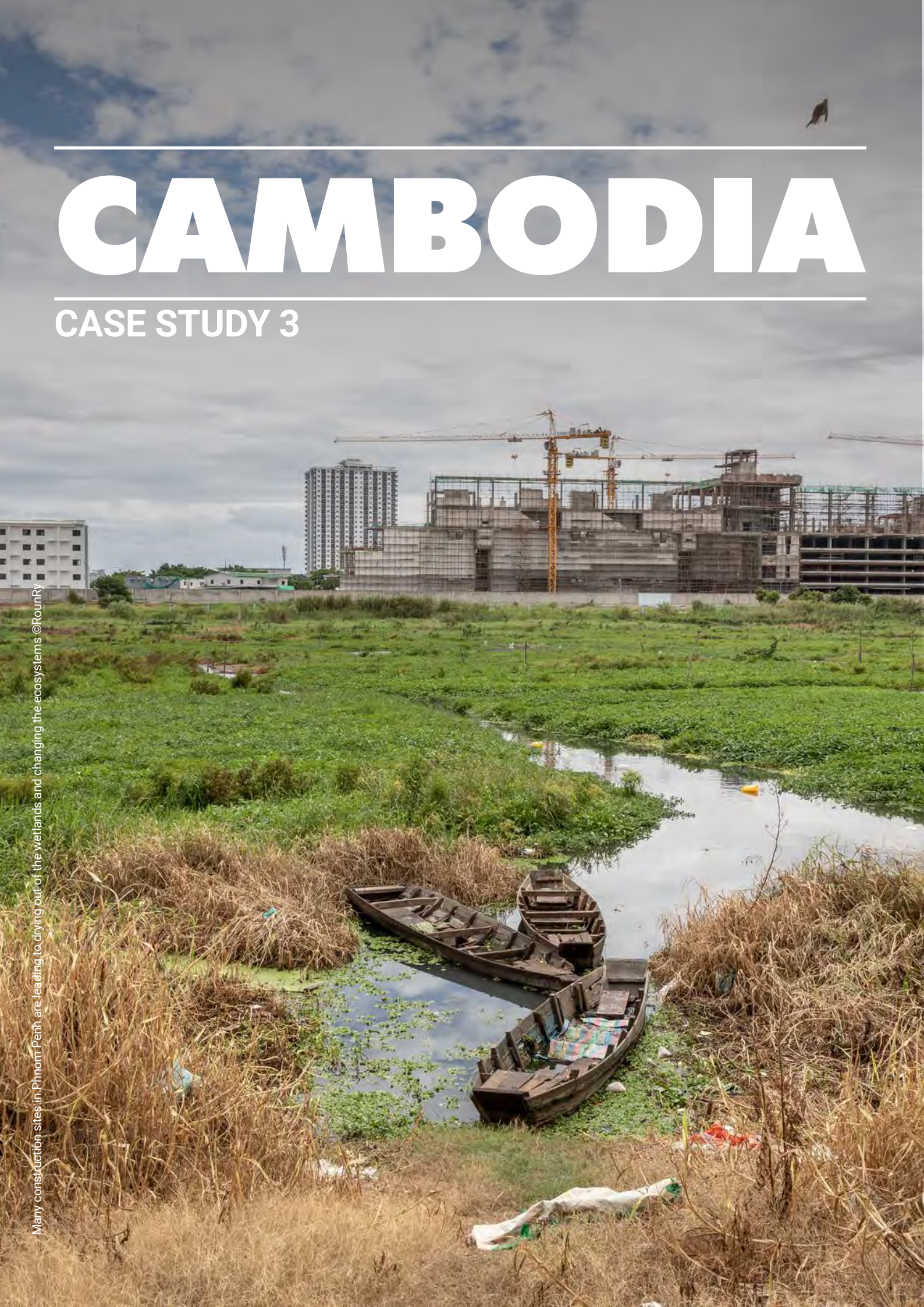
Now let's think about if a disaster happened due to the extreme climate in your community like what happened in Campur or what happened in Izabal with Eta and Iota for example. Let's hope it doesn't happen. How prepared do you think you would be to face an extreme situation?

We do not have preparation, we are not really prepared and year after year we suffer climatic changes in times of rains which are now called "Hurricanes". Before, our ancestors called it winters or storms because it was natural to have two or three days of rain, but today they have given names to those storms. We are not prepared because the agribusiness despite the water grabbing has made ditches or sewer systems to put water in the summer and in the winter when it rains, those sewers fill up. Then the water gets into the sugarcane land and what they do is open the sewers and that water falls back into the rivers and ditches, so that's what floods our territory; Not the rivers because rivers naturally gain strength. In Champerico the law establishes that there should be thirty meters of reforestation on both sides of the river. But the cane farms are the ones that occupy those thirty meters. So when the river rises, the trees do not do their job, so the earth crumbles, the river overflows and takes away our area. We were affected by Storm Agatha, Storm Stan and Hurricane Mitch definitely with all this ... our houses were flooded and we are not heard because the state focuses on the development of the sugarcane, banana and palm industries and not in peasant families".

CAMBODIA

CASE STUDY 3

Many construction sites in Phnom Penh are leading to drying out of the wetlands and changing the ecosystems ©RounRy



CAMBODIA

CASE STUDY 3

Who is the climate migrant? And how can we discuss the complex nexus between the climate crisis and migration in a manner that is productive and beneficial to those whose lives and livelihoods are most at risk from the climate crisis? These are some of the questions that this report grapples with and that have been the focus of much discussion throughout the EU project “End Climate Change, Start Climate of Change” (#ClimateOfChange), co-funded by the European Union’s Development Education and Awareness Raising Programme (DEAR), within which the research is based. Questions that, sadly, as with all things related to discussions on migration, are deeply political in their nature. In seeking to answer them, we draw upon empirical research from four case study countries: Cambodia, Guatemala, Kenya and Senegal. This section focuses upon Cambodia. Research was conducted by the interdisciplinary research team based at the University of Bologna, drawing upon combined sociological, agricultural and food systems, human-geographical and legal perspectives, together with partner organisations on the ground where we were unable ourselves to visit the case study countries due to the COVID-19 pandemic.

Cambodia is consistently ranked among the top ten countries most vulnerable to climate change, predominantly due to lack of adaptive capacity. It remains highly susceptible to climate change as a large part of the population is still dependent on the farming and fisheries sectors, which are predominantly rainfed and the mainly rural population is largely dependent on natural resources for food, shelter and income which makes them highly vulnerable to climate change. The country has one of the fastest growing economies in the world but growth has been very unequal across the population and is characterised by widespread land-grabbing, significant environmental destruction, and marginalisation of the poor, minorities, and indigenous peoples. Many Cambodians would prefer to stay in Cambodia and remain closer to their families, but as there are insufficient job opportunities in Cambodia’s urban areas, and the climate crisis and socio-economic factors are reducing agricultural livelihoods, many Cambodians are compelled to migrate. In the selected area of Battambang, people migrate predominantly to Thailand, and often irregularly, and are thus more exposed to exploitation.



Mr. Chem Oeurn, fisherman and former migrant, looks for fish in the morning in Sangke River, Pouk District (Siem Reap) ©RounRy

16. COUNTRY OVERVIEW

Region	South-eastern Asia
Population (000) ⁴⁸	16 486
Human Development Index	0.581 (rank 146/189)
Ethnic Groups ⁴⁹	Khmer 95.4%, Cham 2.4%, Chinese 1.5%, other 0.7% (2019-20 est.)
Religion	Buddhist (official) 97.9%, Muslim 1.1%, Christian 0.5%, other 0.6%
Urban population (% of total population)	24.7%
Poverty rate ⁵⁰	17.7%
Forested area (% of land area)	52.9 (est.2016)
CO2 emission estimates (mil. tons/tons per capita)	6.7 / 0.4 (2014)
Gender parity index, total net enrolment rate, primary education, 2010-2020 ⁵¹	1
Total net enrolment rate, primary education 2010-2020	91%

Cambodia is characterised by a tropical climate with little seasonal temperature variations between the rainy, monsoon season (May to November) and the dry season (December to April). Cambodia is consistently ranked among the top ten countries most vulnerable to climate change,

predominantly due to lack of adaptive capacity. Cambodia experiences almost all types of hydro-meteorological hazards (cyclones, storms, lightning, typhoons, riverine and flash floods, landslides) affecting most areas of the country.

48. UNData- A world of information <https://data.un.org/en/iso/kh.html>;

49. CIA database <https://www.cia.gov/the-world-factbook/countries/cambodia/#people-and-society>

50. UNDP database: <http://hdr.undp.org/en/indicators/39006#a>

51. <https://www.unfpa.org/data/world-population/SN>

BOX 1: SUMMARY OF CLIMATE CRISIS IN CAMBODIA

Sudden-onset events

Cambodia experiences almost all types of hydro-meteorological hazards (cyclones, storms, lightning, typhoons, riverine and flash floods, landslides) affecting most of the country. In particular, the provinces of Battambang, Kampong Chang, Kampong Speu, Kampong Thom, Kampot, Kandal, Pursat and Rattanakiri are regularly hit by flash flooding. Slower, but more prolonged flooding caused by the overflow of Tonle Sap river and Mekong tributaries, is inundating the surrounding provinces.

Slow-onset environmental changes

(further exacerbated by anthropic activities) include drought, changes in rainfall patterns, loss of biodiversity, soil fertility, deforestation, increase in mean temperature, sea-level rise, land degradation, and soil erosion.

The country has a turbulent and violent history. Part of French Indochina in 1887, Cambodia gained full independence from France in 1953. The brutal Khmer Rouge regime under Pol Pot, in power from 1975-1979, claimed the lives of up to two million people. From 1978 on Cambodia suffered 20 years of civil war. The ruling Cambodian People's Party (CPP) has been in power since 1979. In 2018 the CPP won all 125 National Assembly seats in the National elections, effectively turning the country into a one-party State. Officially, The Kingdom of Cambodia is an elective constitutional monarchy with a monarch, currently

Norodom Sihamoni, as Head of State. The Head of government is the Prime Minister, currently Hun Sen, leader of the CPP and now the longest serving non-royal leader in Southeast Asia. Transparency International ranks Cambodia 160 out of 180 countries in terms of corruption.⁵² Cambodia is a young country; more than 50% of the population is less than 25 years old. The population lacks education and productive skills, particularly in the impoverished countryside, which also lacks basic infrastructure. It ranks in the 144 Human Development Index⁵³.

52. <https://www.transparency.org/en/countries/cambodia>

53. <http://hdr.undp.org/en/indicators/39006#a>

BOX 2: SUSTAINABLE DEVELOPMENT GOALS

The Sustainable Development Goals (SDGs), also known as the Global Goals, form the core of the 2030 Agenda and were adopted by all United Nations Member States in 2015 as a universal call to action to achieve accelerated, high, inclusive, broad based, sustainable economic growth, social economic transformation and development by 2030.

According to the Sustainable Development Goals Dashboard,⁵⁴ Cambodia ranks 102 out of 165 in the Sustainable Development Goals (SDG) Index. The country has achieved SDG 13 (Climate Action) measured through CO2 emissions, and SDG 12 Responsible Consumption and Production. However, it is facing major challenges with a number of SDGs including: SDG 14 Life below Water, in relation to biodiversity loss, fish overexploitation and ocean health; SDG 5 gender equality, particularly in relation to family planning and disparities in education, with the ratio of female-to-male mean years of education received showing little improvement over the past five years, remaining at 72%; SDG 6 clean water and sanitation in relation to wastewater, drinking water and sanitation; and SDG 15 life on land, particularly in relation to permanent deforestation and biodiversity loss. It faces significant challenges in relation to SDG 11 Sustainable cities and communities in relation to population living in slums and access to piped water sources.

16.1 STRATEGIES FOR COPING WITH ENVIRONMENTAL AND CLIMATE CHANGE

On paper, Cambodia has strong policies in relation to addressing climate change. The Royal Government of Cambodia ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1995, approved the Kyoto Protocol in 2002 and has submitted two national communications to the UNFCCC, most recently in 2015. In June 2003, the Ministry of Environment (MoE) established a separate office, the Cambodia Climate Change Office (CCCO). In May 2015, following the MoE's structural reform, this was moved under the National Council for Sustainable Development-General Secretariat (GSSD), mandated to promote sustainable development aimed at ensuring economic, environmental, social and cultural balance within the Kingdom of Cambodia.

The Cambodia Climate Change Strategic Plan 2013-2023 (CCCSP) provides an overall framework for climate change response and integration of climate change issues into development planning at national and sectoral levels. As a result, the Strategic National Development Plan 2014-2018 (NSDP) has made climate change a cross-cutting issue, with the goal of mainstreaming climate change as an essential part of development efforts in Cambodia (USAID, 2019). Within the Global Climate Change Alliance, the Cambodia Climate Change Alliance is a comprehensive and innovative approach to address climate change in Cambodia, funded by the EU, UNDP, and other European partners.

54. Sustainable Development Report 2021 (<https://dashboards.sdgindex.org/profiles/cambodia>)

16.2 NATIONAL MIGRATION POLICY

The right to free movement is not enshrined in the Cambodian constitution, but the secondary law provides for a general regulation of the freedom of internal movement, foreign travel, emigration, and repatriation. However, an effective regulatory and institutional framework for migration is lacking and attention is devoted solely to labour migration (Labour Migration Policy for Cambodia 2015-2018). The first policy on labour migration for Cambodia was formulated in 2010 (MOLVT, 2010) in response to the complications and dynamics of migration issues. The most recent **Labour Migration Policy 2019-2023**⁵⁵ outlines the

Government's framework for developing a sustainable, effective, and rights-based governance system for labour migration. The Policy places emphasis on skills recognition, reducing the cost of migration borne by migrant workers, strengthening support and reintegration services, increasing access to social protection programmes, and increasing the opportunities available for women to migrate through formal migration channels. It recognises the importance of migration for Cambodian households as means to find employment and:

“ For the first time, specific mention is made of climate change. It is understood as a key push factor that pushes people to migrate to other locations, mainly in-country, but also cross-border”.

Anon, IGO, remote interview

In response to the large numbers of Cambodians entering the labour market and the fact that job creation cannot keep up with those entering the market, Cambodia has increasingly relied on the migration of Cambodian workers abroad, especially to neighbouring countries. Indeed, from a state perspective in Cambodia overseas migration is promoted as one measure to alleviate poverty and unemployment/underemployment, especially among its young citizens. This is recognised in the Labour Migration Policy 2019-2023. Cambodia is rapidly becoming a labour-exporting country, and many households now rely on remittances from family members working in Thailand and Malaysia (Vigil 2019). Responses at the regional level include cross-border technical cooperation, capacity building with regard to bilateral and regional border checkpoints, preventing migration-related crime, awareness-raising on the

risks of irregular migration and improving labour migration management. Cambodia is a signatory to the ASEAN Declaration on the Protection and Promotion of the Rights of Migrant Workers, adopted by the Heads of Government in 2007 in Cebu and renewed in 2018 (ASEAN Consensus on the Protection and Promotion of the Rights of Migrant Workers). Migration has become a significant issue in official terms with the ASEAN Economic Community Blueprint 2025, agreed in 2015, which envisages reducing paperwork for work visas. Cambodia has concluded a number of Memorandum of Understandings (MoUs) with Thailand, Malaysia and the Republic of Korea in the field of labour migration. The migration of Cambodian workers is largely irregular, especially for those living in the provinces bordering Thailand, such as Battambang, the province upon which this research focuses.

55. <https://asean.org/wp-content/uploads/2021/12/1.-Labour-Migration-Policy-2019-2023.pdf>

17. METHODS

Information in this chapter is taken from a combination of different methods and research phases. First, a desk analysis of documents from scientific and grey literature was integrated with semi-structured interviews with key stakeholders and experts working on migration and/or environment in Cambodia. These interviews were conducted remotely via video calling systems (Skype, Zoom) in June-July 2020. Results were integrated with empirical data from fieldwork focus groups, climate diaries, and semi-structured interviews conducted by the Royal University of Phnom Penh (RUPP) in July-August 2021 with selected local people from Battambang with the aim to examine the lived experiences of climate change impacts in particular of those who experienced migration or had a family member that experienced migration.

A household survey was also conducted in September 2021 by a specialist company, Angkor Research. A total of 250 quantitative surveys were carried out with households with experience of migration to measure the impact of climate change. The sample was selected from Battambang province and partially aligned with the qualitative component of the study conducted by RUPP. Two strategies for sampling were utilised: purposive sampling for the selection of the three villages congruent with the qualitative component conducted by RUPP, and probability proportional to size (PPS) sampling for the selection of the other nine villages (for further information see Methodology section).

- **A one-month climate diary** (Giacomelli and Walker, 2021): 30 participants.
- **Focus group:** 2 group (5-10 people, gender and age diverse)
- **In-depth interviews:** 12 participants.
- **Household surveys:** 250 households, male and female, from 18 to 65 years old, with some experience of migration



A one-month climate diary

30 participants



2 Focus groups

of 5-10 people each

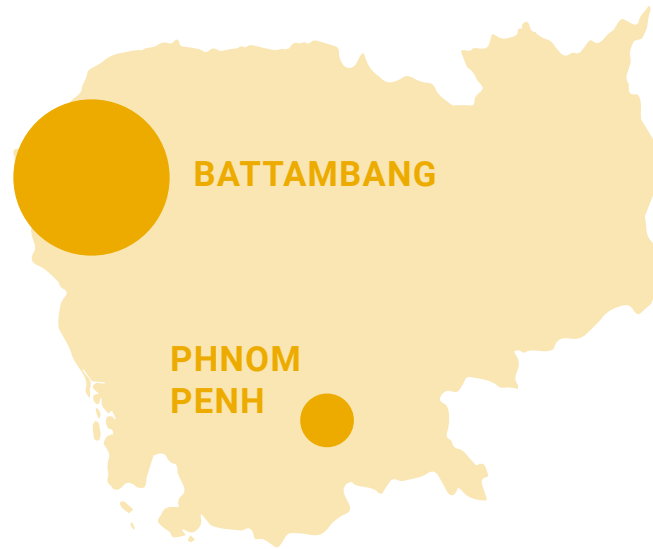


12 In-depth interviews



250 household surveys

17.1 FOCUS: BATTAMBANG PROVINCE



Focus was placed upon the selected areas of Battambang province. Battambang province is situated in the northwest part of Cambodia (Figure 1), about 300 km from the capital Phnom Penh, and borders Thailand along its western border. At its eastern tip, the province is connected to the Tonle Sap Lake. 70% of agricultural land is rain fed. Battambang has fertile land located near the Tonle Sap Lake, traditionally a rich agricultural area producing rice, cash crops and vegetables. Agriculture is the main economic activity in the province (Try et al., 2015). Battambang is at high risk from drought and medium risk from flooding mainly due to heavy rainfall, but also poorly planned drainage systems and increased urbanisation. Battambang is characterised by four ecological zones: upland area, semi-upland area, lowland area and floodplain along Tonle Sap Lake (Sourn et al., 2021). Villages around the lake take three forms—land-based villages, water based (or ‘floating’) villages and land-water based villages. Communities focused upon in this research are people living in the land-based community who engage in farming, but supplement their incomes by fishing, depending on how near the village is to the water body. They cultivate rice as a primary occupation, with fishing secondary. Rice fields are connected to the Sangke River as

a source of water throughout the year and to Tonle Sap Lake and associated flooded forests as a source of fish, firewood, and other animals and plant products (Try et al., 2015). See box Flood-pulse aquatic systems: Tonle Sap

The Sangke river (runs through Ek Phnom district) provides a pathway for fish to migrate from the Tonle Sap Lake to flooded forest, open fields and other river channel networks in the wet season (Try et al., 2015). Flooded forests are in decline due to deforestation and agriculture encroachment (Try et al., 2015; Pool et al., 2019; Eyler and Weatherby, 2019). Fisheries resources are declining because of overexploitation and loss of habitats. Villages are also vulnerable to extreme events such as flash floods, drought, crop disease and insect outbreak (Try et al., 2015).

Migration played a crucial role for the selected rural site, with Battambang having a high proportion of the population work outside of their home village. Being both climatically vulnerable (crop production is threatened by extreme weather conditions such as severe droughts and floods) and associated with high levels of migration, Battambang is ideal to examine the intersection of migration dynamics and climate change.

Specifically, in Battambang focus was placed upon two communes in two districts in Battambang:

- Prek Luong commune (7 villages-flood and drought and plus migration) in the Ek Phnom district.

- Ta Pon commune of Sangke district which consists of 5 villages. These villages experience high migration; in certain periods of the year they are almost empty. Flood and drought are also reported.

TABLE 4 VILLAGES SELECTED FOR SAMPLING

District	Commune	Village
Ek Phnom	Preaek Luong	Bak Roteh
	Samraong Ou Trea	Samraong Knong
	Peam Aek	Doun Teav
	Kaoh Chiveang	Preaek Toal
Samlaut	Sung	Ou Kambot
	Kampong Lpov	Prey Thom
	Sung	Prey Thom
	Mean Chey	Ta Non
Sangkae	Ta Pun	Ta pon
	Ta Pun	Samdach
	Reang Kesei	Reang Kesei
	Vaot Ta Moem	Kampong Chhlang

18. RESEARCH FINDINGS

The following sections briefly report the main findings of the quantitative and qualitative research conducted, combined with the results of the desk analysis.

The findings have been grouped into overarching themes relating to the impact of the climate crisis and the nexus with migration.

18.1 INSIGHTS FROM THE SURVEY

A total of 250 quantitative surveys were completed with a sample composed by households with some experience of migration⁵⁷. The sample was selected from Battambang province and has been partially aligned with the qualitative component of the study being conducted by the Royal University of Phnom Penh (RUPP). It is worth noting that during data collection, heavy rain and floods occurred in Battambang province and this may have affected some responses.

The average size of the household is 6.3 members with 1.3 children per household on average.

6.3 AVERAGE SIZE OF HOUSEHOLD

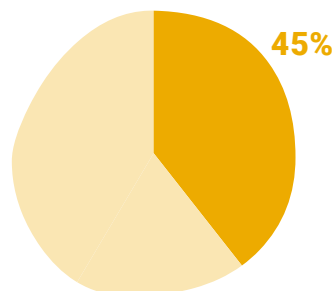
1.3 CHILDREN PER HOUSEHOLD

74% of interviewees are females. Of these, only 45% stated they were the head of the household, in comparison with 96.9% of men.

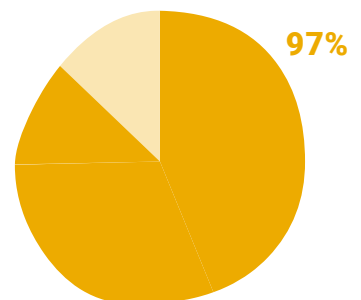
74% OF INTERVIEWEES ARE FEMALE

HEAD OF HOUSEHOLD

WOMEN



MEN



Nonetheless, if we consider all members of selected households we find a balance in gender composition (51% females and 49% men) and 63.9% of families have a male head of household.

64% MALE HEAD OF HOUSEHOLD

⁵⁷ Selected households meet at least one of the criterion: Household moved to the sample village(s) from outside of Battambang province in the last 36 months; or A current or previous household member moved from the sample village(s) to outside of Battambang province for a minimum of one month in the last 36 months.

TABLE 5 SUMMARY OF HOUSEHOLD COMPOSITIONS

Head of the household	Size	Children	Age	Years of education	Members not living with the family
Male	6,4	1,9	36,6	5,10	31,80%
Female	6,3	1,9	36,5	5,00	42%

70.8% of respondents reported that his/her household owns some land for farming and 59.5% reported that they depend on their own farm as a source of food. 62.25% stated that they were primarily engaged in agricultural activities while 7.9% were mainly in fishing.

71% OWNS LAND FOR FARMING

62% AGRICULTURAL ACTIVITIES

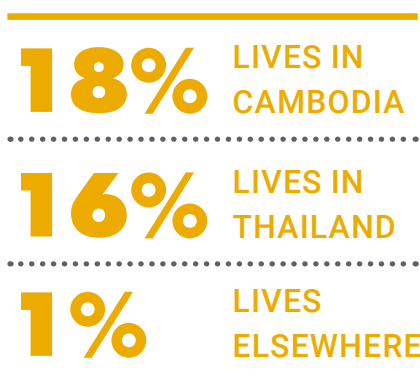
8% FISHING



A man cleaning a buddisht monastery after it was hit by a flood in Bat-tambong ©RounRy

Migration patterns:

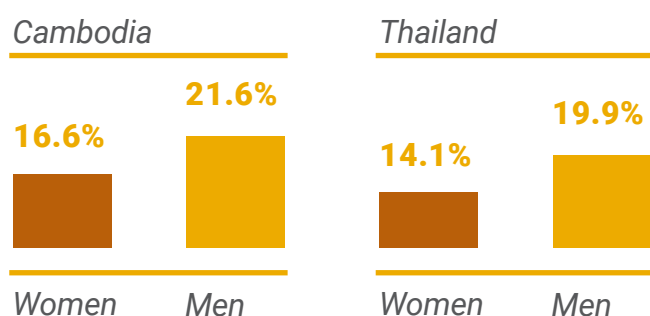
The interviewees were all born in Battambang. Khmer is their first language, while 11% of the sample also speaks Thai. 18.4% of all members of selected households lives somewhere else in Cambodia, 16.2% lives in Thailand and 0.9% lives elsewhere (Korea, Africa, Japan, in religious retirements) with no significant differences among men and women.



A higher frequency of households with a female head are living elsewhere from the family, compared to male-headed households:

- 16.6% vs 21.6% for those living elsewhere in Cambodia
- 14.1% vs 19.9% for those living in Thailand.

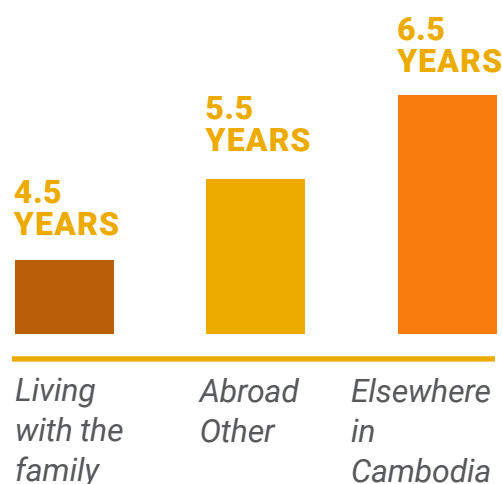
COMPARED MALE-FEMALE HOUSEHOLD



Among those interviewed (250 people), all live in Battambang, but 11,51% of them live elsewhere during the year for work-related reasons in another area of Cambodia (the majority in Phnom Penh), or Thailand for a mean of 4 months per year. The main types of jobs are construction, domestic/care work and other types of skilled labour and 70.1% of them send money back to the family (remittances). Only 3.8% received money from the family during the period away. Hardly any interviewees wished to move in the future from where they live.

Regarding the education of migrant members, those living elsewhere tended to have higher median (and mean) of years of education:

MEAN YEARS OF EDUCATION BY PLACE OF LIVING



Migration was financed via the family's access to loans (45.7%) especially from local alternative money lenders to banks (24%), savings (36.6%), money from relatives (24.8%), money saved from previous migrations (1.6%).

Loans are then repaid with remittances (39.8%) and via selling assets (45.7%).

46% **MIGRATION**
financed by loans

of these

24% **BANKS**

37% **SAVINGS**

25% **MONEY FROM RELATIVES**

2% **MONEY SAVED FROM PREVIOUS MIGRATION**

Loans are repaid

40% **WITH REMITTANCES**

46% **VIA SELLING ASSETS**



Chem Oeurn ponders about the future of his family. Por Treay Commune, Puok District (Siem Reap), Cambodia ©RounRy

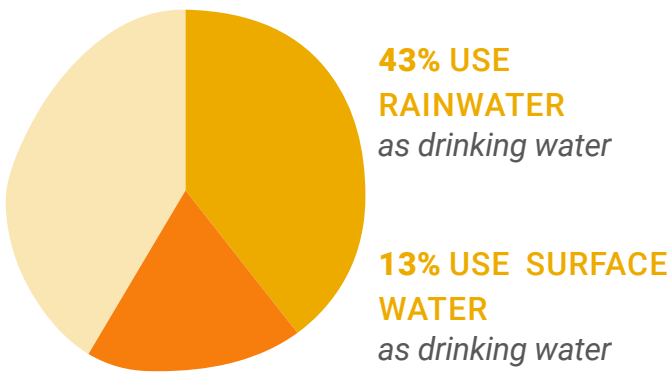
Exposure to Climate Change:

64% of households rely on the sale of agricultural and fishery products among other sources of income, while 42.9% declared rainwater to be the main source of drinking water (followed by 12.6% using surface waters).

Nearly half of the sample (42.5%) reported that they had experienced more than one natural event out of storms, floods, heat waves and drought. In particular, 20.5% reported that they had been affected by storms, 59.1% by floods, 22.4% by heat waves and 48.8% by droughts.

64% SELL AGRICULTURAL AND FISHERY PRODUCTS

43% EXPERIENCED NATURAL EVENT



21% STORMS

60% FLOODS

22% HEAT WAVES

49% DROUGHTS

Unfortunately, over the last 12 months, 23.2% of the sample reported that they did not have sufficient drinking water for an average of nearly 4 months (3.9) while 13% reported that they had not had sufficient food for an average of more than 4 months (4.2).

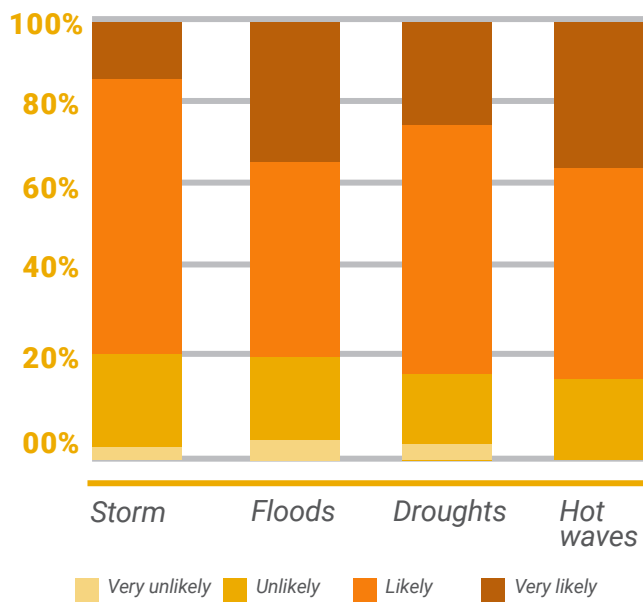
23% NOT HAVE WATER for 4 month

13% NOT HAVE FOOD for more than 4 month

For those who responded that they felt 'likely to be at risk of exposure' to these extreme events, a sub-question was posed regarding feelings of increased/decreased exposure in the past 5 years. Results are in the following figures.

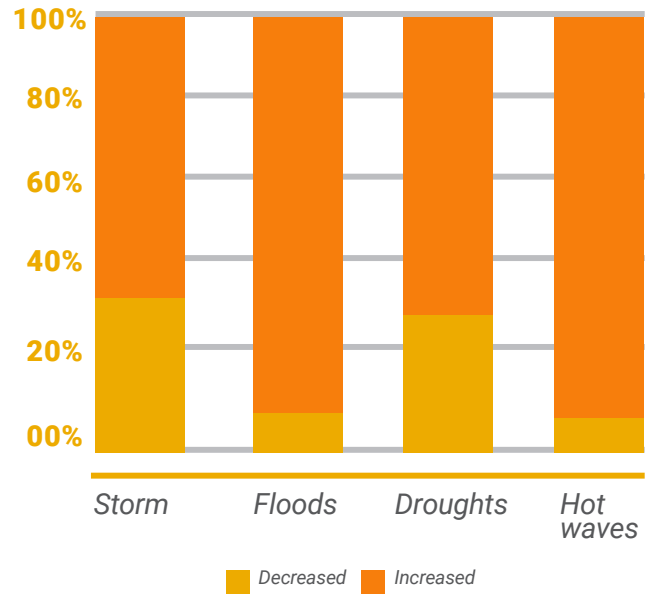
PERCEPTIONS ON THE EXPOSURE TO CLIME RELATED CRISIS

Do you think your household will be exposed to the following events in the next 3 years?



CHANGES IN THE RISK PERCEPTIONS RELATED TO CLIMATE CRISIS

How the risk has changed in the past 5 years?



Only 22.4% received assistance for these problems in particular from friends, relatives, neighbours (22.4%) and government (11.8%).

18.2 HOSTILE ENVIRONMENT

Since the 1990s post-conflict Cambodia has undergone a rapid process of economic liberalisation. Driven by garment exports and tourism, Cambodia's economy has sustained an average growth rate of 8% between 1998 and 2018, making it one of the fastest growing economies in the world (World Bank, 2020a). However, growth has been very unequal across the population and is characterised by widespread land-grabbing, significant environmental destruction, and marginalisation of the poor, minorities, and indigenous peoples (Morris, 2017).

The country remains highly susceptible to climate change as a large part of the population is still dependent on the farming and fisheries sectors which are predominantly (63%) rainfed and the mainly (79%) rural population is largely dependent on natural resources for food, shelter and in-

come which makes them highly vulnerable to climate change (Brickell et al., 2018). Most farmers (56%) are smallholders with less than one hectare of land (WFP, 2019). Rapid and poorly planned urbanisation is causing resultant problems of infrastructure with poor drainage and **waste** systems in urban centres, particularly the capital Phnom Penh.

Land (lack of) was raised by all remote interviewees as a significant problem. Most households have very small parcels of land which can be inadequate to maintain livelihoods, particularly with increased climate change impacts and increasing family size. Land grabbing was also cited as a concern, or the need to sell off land in order to cover debts incurred to cover essential costs, or migration costs

“ I think I should go to Thailand because my family has no land for rice farming and I decide to stop learning more because I have no money to pay for going to school every day.”

**Mr.Chea Seila, Bak Rotes village,
Prek Luong Commune, Ek Phnom District**

18.3 DEFORESTATION

Cambodia's economic growth has also led to substantial decline in forest coverage, which from 2010 to 2016 shrank from 57.07% to 46.86% of national territory (UNDP, 2019). Cambodia has one of the fastest rates of forest loss in the world; much of the forest has been cleared for rubber plantations and timber (NASA Earth Observatory,

2017), including via illegal logging activities⁵⁸. In 2018, the murder of three environmental activists was linked to the national army, which has also been implicated in illegal logging activities (USAID, 2019).

Tong Panha explained how there is

“ *No water for rice cultivation, flood increasing and less water in the dry season. The main cause of climate change in the village is associated with forest clearance. Those who clear the forest, they benefit, while the poor like us are the victims of the natural disaster. Forest clearance is not only in the village, but other places linked to increased floods, less forest to protect erosion.”*

**Tong Panha, Bak Rotes village,
Rohal Suong commune, Ek Phnom District**

Forest clearance is not only in the village, but other places linked to increased floods, less forest to protect erosion.” -Tong Panha (19) Bak Rotes village, Rohal Suong commune, Ek Phnom District, Forest clearance is attributed to increased flood-

ing and intensity of floods, and many people reported this as a particular problem that leads to crop decline and making agriculture a very difficult livelihood. This is leading people to increasingly consider migration to Thailand,

“ *Climate Change is unpredictable weather, high temperature and flood water. Too much water is causing the rice to die and we cannot fish because of the floods. The main cause for climate change is cutting down trees and forests and environmental pollution like plastic burning.”*

**Mr.Chea Seila, Bak Rotes village,
Prek Luong Commune, Ek Phnom District**

“ *A key challenge is the unpredictability of floods. In some year, we are faced with food shortage, and we must migrate to find an income and sometimes just only small amount of money sending back home.”*

**Mr. Voen Socheat, Boueng Tim village,
Tapon commune, Sangker district, Battambang**

58.<https://earthobservatory.nasa.gov/images/89413/cambodias-forests-are-disappearing>

MOEU CHANDARA - ENVIRONMENTAL ACTIVIST (REMOTE INTERVIEW APRIL 2021)

Natural Resources Management and Development (NRMD); Project Coordinator, Cambodian Youth Network (CYN); Forum Coordinator, Interfaith Cooperation Forum (ICF)



Moeu on patrol with the local community in Preah Vihear. "We found many trees which were already cut off and waiting to be transported out of the forest"

Moeu Chandara is a young environmental activist based in Cambodia. He works for Citizens Engaged in Environmental Justice for All (CEEJA), funded by the EU. This initiative enables local people to demand their rights for climate justice and protect their rights. He works particularly on combating illegal logging and deforestation, working with local communities to provide training so that they are aware of their rights and how to exercise them. In order to campaign on environmental issues a Memorandum of Understanding (MoU) is required with the Ministry of Environment, otherwise the activity will be banned. Many organisations are wary of this as they feel their activities will be controlled.

“ The biggest problems raised are deforestation. Corruption and illegal logging lead to much deforestation, [...] it happens systematically, there are a lot of powerful people involved, large corporations - mostly Vietnamese - engaged with political parties, so local party doesn't have power to block the logging. Although it is officially a Community protected area (CPA), Prey Lang still experiences illegal logging. There is a lack of capacity to control the area.”

“ We have a group called Prey Leng Protected Community Network which documents a lot of illegal logging. CEEJA supports them in using technical aids to document deforestation. They release monitoring reports, these findings were all rejected. The situation is left to politicians, who don't allow local people to exercise their rights. Most are local indigenous people and are protected under the protected area law. ... But corruption complicates things. For example, three activists from 'Mother Nature' were arrested for raising awareness on environmental destruction”.

When common people are interested in environmental issues and want to exercise their rights, like campaigning, if they are arrested one by one, who will be willing to challenge them in the future?"

“ We work like active citizens, using the law to demand our rights and to advocate with relevant stakeholders [...] The problem is that the law is implemented / interpreted differently. Local authorities interpret it differently. So we don't have any common sense of the same law. This is the problem here.”

“ The connection between mobility is important: “in my perspective I can see that the local community are heavily dependent on cassava (*Manihot esculenta*) product and most of them are not allowed into the forest to harvest native products any more [as they have been banned by the government which considers the Prey Leng Protected Community Network to be an illegal group]. So some migrate to work in factories in Phnom Penh and elsewhere. When we cannot protect our forest in a sustainable way and people cannot harvest the products from the forest, they will lose their job and so then they will be forced to migrate. For indigenous people in Cambodia, 90% of their income comes from products from the forest, they are dependent upon small agriculture so when they cannot harvest products from the forest how can they survive? Young people, they can migrate to the city, to anywhere that can pay them, where they can find work. But old people? Mostly, the old cannot migrate anywhere so they just stay home taking care of the child and cannot do any regular activity. This is the rapid chain of this situation.”

“ Our activity is monitored by the local authority. We are independent and neutral from any group, so we just use our name as active citizens, and use our rights to protect our natural resources, like the forest, because we want to see the forest keep standing, we are not happy that the MoE or government don't encourage us or other activities to actively join in environmental activity, so if they ban us like this then in future I can assume people will not be active in protecting environment. They should re-think this and have a dialogue. The government has a youth strategy, [...] and clearly stated they encourage common people to join activities to protect their natural resources, as the government has committed to do this. To take care of at least 60% of the forest.”

But if the government keeps banning activists or youth from freely engaging in activities or serving natural resources, then how can the government achieve their commitment?"

Prey Lang is one of the most biodiverse forests in Cambodia, and more than 250,000 people live in and around the protected area. Most of them identify as Indigenous Kuy. Prey Lang is a crucial part of the Kuy people's livelihood, culture and spirituality. Prey Lang provides water to the Stung Sen and Stung Chinit rivers. Both flow into Cambodia's Tonle Sap Lake, home to one of the world's largest fresh-

water fisheries (see also Box 4). Amnesty International (2021) has documented how the Prey Lang Community Network (PLCN) – most of whom are Indigenous Kuy – have been banned from entering the wildlife sanctuary to conduct their community patrols. This ongoing repression seriously undermines environmental efforts to protect Prey Lang and Indigenous peoples' rights⁶⁰.

60.<https://www.amnesty.org/en/latest/news/2021/02/cambodia-widespread-illegal-logging-in-prey-lang-rainforest-amid-ban-on-community-patrols/>

18.4 WATER GOVERNANCE AND IRRIGATION

Climate change in the form of increased temperatures, drought, and changes in seasonal rainfall patterns, in combination with extensive damming for hydropower throughout the Mekong Basin, also by China and Laos further upstream, threaten to impact food security and human health through reduced freshwater availability and, in

turn, agricultural and fishery production (USAID, 2019). Remote interviewees reported that human intervention in the form of dams and irrigation systems has destroyed the hydro cycle and the drainage system does not work, increasing flooding. Further, as one remote respondent noted:

“ Water governance is managed by eight different bodies and is highly complex and politicised”.

**Aaron Sexton, independent climate change consultant,
remote interview**

The large number of bodies involved means it is very complex and inefficient. In rural areas, most of the population does not have access to potable water, exacerbating health risks (USAID, 2019).



Mr.Chum Choeun from Samlout district. “Flash flood destroyed the red corn crop as well as the road in Doun troeuk village,Ta sanh commune, Samlout district.”

18.5 ERRATIC RAINFALL

Lack of technology and know-how makes it difficult to address the issues. As one remote respondent explained, “Now we don’t have irrigation systems, everything is based on rainfall. No rain, no production. It is very very risky for the agricultural sector. People cannot always migrate. Some people would like to move but they cannot” (Min Sophoan, ASVF, remote interview). There is a circularity in the vulnerabilities of rural populations

in that the impacts of climate change render subsistence-oriented agriculture a wholly inadequate livelihood strategy, and the lack of social protection mechanisms enhances the vulnerabilities of rural populations to climate change (Brickell et al., 2018).

Interviewees agreed that the key impacts of climate change relate to water:

“ *Loss of agricultural yield, the food production, the water quantity and quality or sanitation for the family. Water is the key problem as it is more polluted with increased heat and increased temperature.*”

Mrs. Norng Sarim, Sung Village, Sung Commune-tt

“ *In the future, we may not face water shortage as the government is constructing a spillway [a structure that either forms part of a dam, or is found just beside one and is used to pass flood water safely] across the river to store and regulate water along the river. But water for irrigation may not be enough due to the poor infrastructure system.*”

Ms Tong Panha, Bak Rotes Village

“ *My rice cultivation is based on seasonal flooding from Tonle Sap and Sangker river. Last year, my rice was badly affected by the onset of flooding from the river. [...] clearly the impact caused by climate change. We do rice cultivation; we depend on the sky and rain and sometimes we get more yield and sometimes we face risks. Last year, my rice was badly affected by the onset of flooding from the river. [...] But if the water level rise is too low, it also affects rice crops and leads pests, mostly rats and mice, to attack the rice.*”

**Mr. Voen Socheat, Boueng Tim village,
Tapon commune, Sangker district**

CLIMATE DIARY: MRS.SAO CHANSENGSORYA, BATTAMBANG PROVINCE



Tapon commune, Sangke district, Battambang province



Vegetables from Tapon commune, Sangke district, Battambang province

“ Families in Battambang have been unable to make a living this year from their vegetables. This vegetable, [Phkar Salit] did not have a good yield as insects destroyed the flowers and its tree did not grow well due to lack of rain. When it did grow well, there was too much rain which destroyed all.”

Groundwater is widely used for domestic water supply in Cambodia, and is increasingly being used for small-scale irrigation. However, the risks of depletion and endangering domestic groundwater supplies are high. Groundwater use is widespread in the Mekong Delta where other sources of water are not available (Try et al., 2015). In Battambang there has been an increase in using tube well irrigation to irrigate rice during the dry season. However, due to the over use of tube wells, farmers are now competing for the use of groundwater. Water tables are depleting owing

to climate change causing higher temperatures, more intense droughts and less/ more erratic rainfall and changes in land use. Some of these tube well irrigation systems are being replaced by formal irrigation schemes (large infrastructures funded by China).

However, for now villagers are reliant on wells for water, which are subject to regular flooding and cause problems for irrigating their crops. This issue was raised and discussed in the focus group in Battambang as a major problem, as one participant outlined:

“ There is currently a shortage of water for agriculture in the region due to the growing population of farmers, increasing the demand for water for agriculture and the local irrigation system is still lacking, which is why agriculture is declining. [...] This village has no canal or water way to get or take water out from the farm or village. We have only digging well to keep water for watering the vegetable or pepper or durian.”

Mrs Kuy Rin

BOX 3: FLOOD–PULSE AQUATIC SYSTEMS: TONLE SAP

Tonle Sap Lake, river, and tributaries together form a large and connected floodplain system called Tonle Sap Ecosystem which is linked to the water levels of the Mekong River, one of the world's largest tropical rivers which originates in China. The Tonle Sap Lake alone provides an annual freshwater fish catch of around 500,000 tons, which provides Cambodians with around 75% of their protein intake (Eyler and Weatherby, 2019, Sourn et al., 2021b). Approximately 80% of the Cambodian people depend on a combination of fish production and small-scale agriculture for their livelihoods (Pool et al., 2019).

The Tonle Sap receives seasonal floods from the monsoon rains via two major sources of water: the Mekong River and the surrounding mountain ranges, including the Cardamom Mountains, which cover more than 30% of the country's territory, and the Dangrek mountain range, which serves as the current border between Thailand and Cambodia. Unique among all rivers in the world, the Tonle Sap river has a bi-directional flow depending on the season. Each monsoon season massive rains reverse its directional flow, sending water, fish, and fish eggs from the Mekong River system flooding into the lake; whereas in the dry season the Tonle Sap Lake drains into the river (Eyler and Weatherby, 2019). This flood–pulse aquatic system regularly inundates terrestrial landscapes, extensively increasing those systems' habitat complexity and resource availability. Many fish in flood–pulse lakes migrate from open water into flooded forest areas to spawn (Pool et al., 2019).

The ecology of Tonle Sap is complex, to better understand it can be conceived of as three different zones:

- The innermost zone is the permanent lake, always filled with water;
- The next zone consists of flooded forest and grasslands which is inundated for about 5 to 8 months of the year during the monsoon season and populated with trees and bushes. This flooded forest area is extremely important for Tonle Sap's productive fisheries. Eggs and fish larvae flushed into the lake by the monsoon pulse find habitat in the flooded forest and thrive on the nutrients from rotting organic material in the flooded forest. When the water recedes, the fish move back down to deeper places and deep pools. These fish migrations are both short and long duration.
- Finally, the third zone consists of an agricultural zone rich in sediment deposited by the highest floods, this forms a peripheral area around the lake (Eyler and Weatherby, 2019).

Flooded forests are rich with deposited sediments and local farmers often clear forests for planting cash crops in the dry season. Such forest clearance robs the next season's fish migration of habitat and food sources (Eyler and Weatherby, 2019). The delicate Tonle Sap ecosystem is under threat from habitat loss and flow change due largely to dam development, unregulated timber collection, climate change and unregulated human activity around the lake (Pool et al., 2019; Eyler and Weatherby, 2019; Sourn et al., 2021).

Flooded forests are protected areas, where fishing lots were allocated and it is illegal to clear trees. However, lots were abolished by the government in 2012 and converted to community fishing grounds or reserved for conservation. In spite of this, much of the forest has been illegally cleared, which has led to a decline in fish stocks, as flooded forests are spawning areas for fish. Local people engage in subsistence farming and fishing for their own consumption, as well as cash crops such as Durian and rice. Farmers create ponds that are used both for rice cultivation in the dry season and to keep fish.

In the past, **fishing** was an economic activity for many and under the fishing lots, farmers could sell their fish to the fishing lot owners at a set price. Fishing lot owners have the high commercial large fish such as Giant Snakehead fish, the most valuable fish in Tonle Sap. Since the abolition of the fishing lots, the fishing industry is increasing, but in the form of aquaculture and it is harder to sell fish at the market.

Of the few participants who mentioned fishing, all referred to how it was more difficult to catch fish as there were less fish due to the irregular weather patterns, reduced rainfall and the reduced flood-pulse of the floodplain.

“ *[the climate] has changed over the past 5 years as it does not rain regularly like before, flood water does not come like and fish is not as many like 5 years ago.*”

**Mr.Chea Seila, Bak Rotes village,
Prek Luong Commune, Ek Phnom District**

“ *The destruction of forest land and some even destroy the flooded forest and farming extension. In the village as more flooded forest is lost, we also lose natural fish which is replaced by the aquaculture fishery such as catfish.*”

**Mr. Voen Socheat, Boueng Tim village,
Tapon commune, Sangker district**

“ *Climate Change is irregular weather... . It changed from before, like the dry season is the dry season and rainy season is the rainy season. Before, in June, my family could fish in the field. Now it is July-August and there is no water for fishing.*”

**Mrs.Reth Chanthoeun, Bak Rotes village,
Prek Luong commune, Ek Phnom district, Battambang Province**

The water in Tonle Sap Lake is decreasing. As participants observe, the flood-pulse aquatic system is altering both in terms of a reduction in the number of days of floods as well as water levels. This is damaging soil diversity and also reducing fish catch as it affects fish migratory patterns and spawning grounds. Research finds that the 'reduction of flood discharge in the Cambodian floodplains cannot be attributed solely to either upstream developments or natural climatic variability – local anthropogenic factors are likely the main reason' (Chua et al., 2021). These are identified as irrigation and sediment decline (ibid).

Many villages along the river and Tonle Sap Lake floodplain make their living from **fishing**, but most of the people here are illiterate and were not included in the research, also as they do not migrate due to lack of opportunity (lack of social and economic capital). Villagers in Tapon still fish in the lake in the Tonle Sap Lake floodplain, mostly when the water recedes from the great lake. Most people RUPP interviewed in both Bak Rotes and Boueng Tim village are still involved with fishing but on a much smaller scale than previously. They have a community fishery but with a smaller area which is often known as fishery refuge for protection, conservation and seasonal harvesting, sometimes for special events like New Year. The cancellation of the fishing lot system, the designation of the Tonle Sap Lake as a biosphere reserve, the zoning of the protected flooded forest, and the development of community fisheries have changed the way in which people access resources in the lake. The Tonle Sap Lake has faced increased commercialization of fisheries resources in which fishing and farming communities then compete for resources (Sithirith, 2016). This, together with deforestation destroying spawning habitats and increased infrastructure projects around the lake, is decreasing fish populations.



Mrs. Hann Kimheang, Baseth village, Tapon commune, Sangke district
"Tonle Sap water started has started to recede and the farmers have not started growing anything yet"

What was also evident from responses is the interlinkage between the ability to make a living and the impact of the climate on this. For example, one remote interviewee stated, "I can say that environmental migrants concern the farmer, who is more impacted on agricultural products in Cambodia, very small land, so when they have an impact of climate change one or two years then they migrate to Phnom Penh or other province for work. More impact on small land farmers." (Mr. Sorn Sunsopheak, NCDDS).

As such, both remote and field interviewees' responses highlight the complexity of the nexus as well as the intermingling of diverse factors that lead people to move: the economy and the environment cannot be disentangled. As scholars have also outlined, for small scale and subsistence farmers it is their pre-existing vulnerabilities, which have been socio-politically shaped, and not just their exposure to risk, which makes them particularly exposed to the impacts of the climate crisis (Vigil, 2019).

CLIMATE DIARY: MS. SOEUNG VANNA, BATTAMBANG PROVINCE.

I would like to present the people with 187 households who got the rice seeds from Cambodia reserved food system committee to re-build the rice from the flood disaster.



Ms. Soeung Vanna Prek Luong Commune, Ek Phnom district, Battambang Province.
"People who got the rice seeds from Cambodia reserved food system committee"

18.6 DEBT AND MICROFINANCE

At household level Cambodians have become increasingly reliant upon microfinance (MFI) (see BOX 4) borrowing to cope with gaps in public service provisioning (Brickell et al., 2020; Crang et al., 2020). MFI loans are taken on by smallholder farmers from rural villages across Cambodia to cope with the destructive impacts of climate change on agrarian production. This issue was highlighted by remote interviewees as a significant problem. Debt is used to cover basic food and health needs in the lack of alternative state provided social protection. The high interest rates on loans mean that many rural people end up losing their land as they become forced to sell to cover their debt

when they are unable to make repayments, this results in debt bondage and detrimental impact on living standards. Here, the linkages between land ownership, lack of access to credit and the failure of state social protection intermingle with the effects of climate change to enhance people's vulnerabilities to debt bondage. Debt may also be incurred to finance migration. Remittances are often used to pay off debt (Brickell et al., 2018; Jacobson et al., 2019; Pak and Saing, 2019) and there is a positive correlation between household debt and migration (Pak and Saing, 2019). This was also raised in remote interviews:

“ When households cannot farm, as they are dependent on rainfall, then their rice production is really low. So many access loans from MFI and then they have to pay the loan back. This causes people to migrate to other locations and find jobs for income.”

Anon, IGO, remote interview



Pon Pinn, 30, cooking lunch in his home after his morning work shift in Phnom Penh ©RounRy

BOX 4: MICROFINANCE (MFI)

Cambodia has one of the largest **microfinance industries (MFI)** in the world, the typical loan amount now exceeds the average annual household income and requires land-based collateral (Green and Bylander, 2021). **Cambodians have become increasingly reliant upon MFI borrowing to cope with gaps in public service provisioning and are increasingly over-indebted, compelling families to reduce their food consumption, take out new loans to service prior debts, migrate, and/or sell their land in distress** (Brickell et al., 2020; Crang et al., 2020; Green and Bylander, 2021).

MFI loans are taken on by smallholder farmers from rural villages across Cambodia to cope with the destructive impacts of climate change on agrarian production. These loans have become a key means to meet household consumption needs, as well as to buy farm inputs and to invest in irrigation to guard against increasing climate unpredictability. Rice is the main crop. Despite growth in agricultural production, yields remain low and vulnerable to climate-related shocks. MFI staff and local authorities either work to reschedule their loans or coerce borrowers to sell off their land to cover their debt.

Initially established in the 1990s as a specific programme of small loans aimed at enabling demobilised soldiers to develop small enterprises and reintegrate into social life, microfinance has since transformed into a for-profit model comprising high interest rates and increasing loan amounts (Brickell et al., 2018). The combination of government deregulation, escalating interest rates, and unsustainably high loan amounts has been accompanied by a rapid rise in clients, with borrower numbers rising from 300,000 in 2005 to 2.2 million today (Brickell et al., 2020). The Cambodian microfinance industry is one of the largest per capita in the world with the majority of shareholders being foreign investors (Green and Estes, 2019). Scholarship suggests that the rapid growth in microfinance in recent years has contributed to debt-driven dispossession (Green and Estes, 2019). **In January 2020 the UN's independent debt lead Juan Pablo Bohoslavsky reported that Cambodia had a microfinance crisis** (in Brickell et al., 2020).

Interviews conducted in the field confirmed these findings. The majority (8 out of 10) of interviewees in Battambang explained how they had had to turn to MFI to finance the migration of family members and/ or to cover agricultural costs.

Many explained that their family members had been forced to migrate to Thailand to find work to repay debt incurred via MFI to pay for agricultural improvements.

“ My son went to Thailand because I have borrowed the money from MFI for doing the agriculture and then I lost with flooded water so much.”

Kuy Rin

The circularity of the debt-migration loop was very evident. This corresponds with scholarship which shows how remittances are often used to pay off debt (Brickell et al., 2018; Jacobson et al., 2019; Pak and Saing, 2019).

Keo Samorn outlines three factors that push people to migrate, referencing his own family situation whereby his 25-year-old son has migrated to work in Thailand and help the family:

“ First, we owned to the Angkar⁶¹ and we do not have any regular work to pay back the loan. Second is the need to pay back the loan which I encouraged my son to migrate to find work in Thailand. The third issue is that my son was only able to finish grade 3 at primary school while he was looking after four cows and learning at the same time. We were poor so it took more time for him to study and look after cows and help us work on agriculture and farming. We sold our cows to upgrade our farms, growing black peppers and he stopped learning. The option for him was to migrate to find a regular job in Thailand.

The money borrowed from MFI was used to construct water wells, water systems, and water pipes for my farms with a total around \$3,000 in 2019. The money which needs to be paid back is around 1 million Riel or \$250. We wish to pay off the loan but the MFI did not accept as they want us to pay based on the agreement and period they propose. We could have paid off the loan in 2019 but they made us wait until August 2021. Most money my son sends is used to buy agricultural inputs, taking care of farming and paying interest to Angkar (MFI).”

Keo Samorn, Suong 1, Suong commune, Samlaut district, field interview

Some of the negative impacts of migration away from rural areas were raised during the remote interviews. Predominantly, the social impacts of a large proportion of the younger population moving out and leaving children behind with more elderly grandparents. Interviewees stated that this had an impact upon children’s wellbeing, as they often spent long periods without seeing their parents. Additionally, access to school could be affected owing to the families’ financial difficulties. Further, it was pointed out that conditions in destination countries may often not be particularly safe or sanitary, particularly as the majority of cross-border

movements are unauthorised. Those who migrate with their whole family may end up leaving children in rented accommodation with no access to schooling as they are not entitled to it. Remote interviewees felt that there was a need to look at the socio-economic impacts of migration on the families left behind, such as children who are left without their parents. Indeed, whilst remittances are seen as a main contribution to the economy, the “dark side” of migration, the vulnerabilities of the migrant and the social impact are often forgotten (Dr Sokhem Pech, Cambodia Development Resource Institute).

“ As a father, I miss my son and am afraid that when he comes home, he may bring COVID-19 to the whole family. I can only meet my son via telephone or by chatting on messenger.”

Keo Samorn

61. Angkar means organisation. In the past, during the Khmer Rouge period, Angkor refers to the state which includes commerce and military carders. Currently, most people who borrow money from MFI refer to them as Angkar.

18.7 HUMAN MOBILITY IN CAMBODIA: PATTERNS AND TRENDS

Interviewees confirmed that many travelled to Thailand irregularly and then sought work/ regularisation once there. All had either migrated themselves or had relatives migrate to Thailand for work. The main source of information is gathered from brokers and relatives already working in Thailand. Interviewees expressed diverse patterns of working in Thailand, returning to try work-

ing in agriculture again and then if this failed due to poor crop yield, floods or irregular rainfall returning to Thailand again. Thailand is seen as a place where work is possible and an income can be gained, as opposed to farming and/ or fishing in Battambang province where all expressed increasing difficulty in making a living.

“ We did not have a legal document but when we arrived in Thailand, the factory owners paid for me for the legal document but with a deduction.”

**Voen Socheat, Boueng Tim village,
Tapon commune, Sangker district**

Considering the nexus between labour migration and human trafficking, in 2014 Cambodia and Thailand renewed the MoU on Bilateral Cooperation for Eliminating Trafficking in Persons and Protecting Victims of Trafficking first signed in 2003. As one expert interviewee explained via remote interview, “climate change relocation strategies are not a policy priority in Asia, primarily because in Asia there are already-existing migratory movements, governments are therefore more interested in facilitating labour migration - environmental

migration is not acknowledged and the issues are not connected together within Asia generally. There is no regional discussion on environmental migration” (Anon, IGO, remote interview). Within ASEAN implementation is weak owing to the competing interests of Member states. This differs from the Pacific which leads the way with climate change policies, such as relocation strategies, as they suffer impacts of climate change and feel a lot of people may need to move as a result.



Preath Nakri, a former migrant, carrying her son to her house before the rain (Puok District, Siem Reap) ©RounRy

18.8 MOBILITY

Whilst migration has long been a livelihood strategy for rural Cambodians seeking to diversify their income streams, over the last twenty years, migration has become one of the most important transformational changes in Cambodian society. Steady urbanisation has been fuelled by continued inflows of migrants from rural centres, reshaping the spatial distribution of the Cambodian population within the country, especially in Phnom Penh. Scholarship and remote interviews confirmed that migration patterns are different depending on geographical location and length of stay can differ between a few months to longer-term.

Remote interviewees confirmed these movements are predominantly in rural communities.

People move **internally** to cities to diversify income streams. There is much rural to urban migration –people moving as livelihoods affected by climate change or environmental degradation. Movement is also linked to the general flow within the country. **Rural to rural movements are also significant.** International mobility may be a secondary movement. It is important to take a case by case approach. Additionally, respondents in remote interviews confirmed that people tend to **migrate in steps**: First, they try to stay in the village to try and support their family, then if they cannot adapt, they move to raise funds, and then may migrate again to work in other areas. Most cross-border migration involves very low skilled people, often illiterate.

“ Need to look at different movements in different geographies: in the flat plains people migrate away to work in the city and return at weekends to their village to farm; but in coastal areas may move away, cross-border migration is more likely.”

Anon, statutory body, remote interview

Movement across the border is very frequent and of diverse durations, depending on family need, type of work found and agricultural yield. As this example from fieldwork interview with Mr. Vooun

Sokcheat shows, there is a false divide between mobility and immobility, people engage in diverse mobility and labour strategies to enhance their income/ find an income:

“ I finished grade 4 in the village. I am a farmer. Previously I migrated to Thailand in 2014-15 and worked in the chicken meat industry. In 2016, I worked in Battambang and Poi Pet, border towns as an iron smith and mechanic. I did not have a fixed salary but was paid daily as a labourer. I went there with my brother-in-law who already works there.”

“ He explains migration as depending upon three factors: “(i): livelihood, (ii) low skill and low education, and (iii) less jobs available in the village and local level, except to migrate for work.”
and further states that “In the future, I have no wish to migrate to another country seeking for work. Because I wish to stay in the village, not to separate from my parents and dream of having my own business in the village.”

**Mr. Vooun Sokcheat, Boeng Tim,
Tapon commune, Sangker**

Migration to Thailand is an evident coping strategy for households to respond to environmental stress. Yet, at the same time, migrant workers experience high levels of exploitation and vulnerability in Thailand—much of which derives from the high costs of legal migration and the resulting insecurity that comes with irregular status. This situation suggests improvements in migration policy have the potential to also support climate resilience (Bylander, 2016). This was also identified by remote interviewees, also as a means of addressing some of the complications with migration as an adaptation strategy. Whilst there are increased legal channels to migrate through MoUs to Ma-

aysia, Thailand, South Korea, only a small proportion of Cambodians migrating abroad use regular channels to migrate due in part to the high cost, considerable time investment, and administrative complexities involved (ILO, 2020). Tola Moeun, Director of Central (A Cambodian human rights organisation) reported the same root causes of people migrating as raised by field interviewees, and flagged MFI debt and the high cost of legal papers to migrate to Thailand as major problems. The circularity of the problem is expressed by Mrs. Keo Rath (52), Sung village 1, Sung Commune, Samlout district. Her family took out a loan of \$500 with a Micro Finance Institution (MFI):

“ *To recover my peanut and soybean crops. Unfortunately, we did not get enough yield from my planting. So, my husband decided to go to Thailand with our daughter to find money to pay back to the MFI ... We also borrowed money to facilitate legal documents and the working permit.”*

Mrs. Keo Rath

Also, Mrs Kuy Rin in Sung 2 village, Sung Commune, Battambang, who looks after her two

grandchildren, as her son and his wife have gone to work in Thailand explains:

“ *My heart wants to get my son to work in our country after I have paid MFI and bank ...My son was not happy because he is separated from his children who stayed with me and he has no time to take care of his children.”*

Mrs Kuy Rin in Sung 2 village, Sung Commune, Battambang

Remote interviews conducted pointed to the fact that migration has been a way of life for improving livelihood in Cambodia for many years – it is very difficult to make direct links between climate change and migration - however, all agreed there is a correlation. The impacts of the climate crisis are being keenly felt in the area. People are dependent upon agriculture and small-scale fishing, and the climate crisis is making it increasingly difficult to make a livelihood. It was also felt that the number of people having to move due to climate change is “increasing a lot because of the impact of the long drought and also flooding” (Mr. Sorn

Sunsopheak, NCDDS, remote interview). Climate change is not the only factor pushing people to move - people move for a number of reasons, primarily economic, education, or other, and it is difficult to disentangle the factors. However, climate change is seen to interact with these multidimensional causes and exacerbate livelihood vulnerabilities leading people to migrate. This was reflected in fieldwork interviewees, all stressed that the situation had worsened over the past five years, with increased irregularity in rainfall and sudden intense floods.

“ We cultivate rice; we depend on the sky and rain and sometimes we get more yield and sometimes we face risks. ...with less water from the river, our rice faces drought and pests such as mice or rats attacking rice crops. [...] A key challenge is the unpredictable floods. In some years, we are faced with food shortage, and we must migrate to seek income and sometimes just a small amount of money to send back home.”

Mr. Voeun Sokcheat, Boeng Tim, Tapon commune, Sangker

“ A storm in my village destroyed my house [...]. The flood killed my vegetables. So my daughter decided to go to Thailand to find work to pay the loan my family got from MFI to plant the pepper and durian fruits. My two daughters have gone to Thailand to work in orange's factory, and they have gone knowing the people used to go to Thailand many times.”

**Mrs Norng Sarim, Sung 1 village,
Sung Commune, Samlaut district**

“ There are not many fish, so I decided to go to Thailand with my uncle and get the money from my work regularly and I get to send home and keep paying back to my uncle for my passport and visa.”

**Mr. Chea Seila, Bak Rotes village,
Prek Luong Commune, Ek Phnom District**

Field interviewees expressed that they did not wish their families, or themselves to have to engage in migration, often irregular to Thailand. If they could cover the costs of their crops and make a living from agriculture in Cambodia, or find alternative work elsewhere in Cambodia, such as Phnom Penh, this was reported as preferable. In focus groups and interviews, the consensus was that people did “not want to migrate if there

is easy irrigation for planting or decent work is possible”, This confirms scholarship that evidences how many Cambodians would prefer to stay in Cambodia and remain closer to their families, but as there are less employment opportunities in Cambodia's urban areas than the labour offered by Cambodians, many are compelled to migrate (Vigil, 2019).

“ I do not wish to allow my husband and daughter to work in Thailand as migrant workers once we have paid back the loan and the COVID-19 outbreak is over. We want to find work in our country, not cross the border with security risk.”

Mrs. Keo Rath, Sung village 1, Sung Commune, Samlaut district.

A number of interviewees mentioned the shame associated with migration overseas. One mother whose daughter has migrated to work in Thailand expressed how this was often seen as a source of shame in the village.

She expressed her desire that better regulatory system was implemented that could also alleviate some of the shame associated with migration:

“ I feel ashamed to let my daughter work outside the country as migrant workers. We often received negative perceptions from our neighbour for letting our daughter work as a migrant worker in Thailand.
I wish the local government and government at all levels to have better laws to protect migrant workers to make sure we have secure and safe feelings on work and image from neighbours. Better legal support and available works which they can survive with proper working conditions.”

**Mrs Norng Sarim, Sung 1 village,
Sung Commune, Samlaut district, fieldwork interview**

CLIMATE DIARY: MS. SOEUNG VANNA, BATTAMBANG PROVINCE

“ Mobility means to change or move from one place to other one place by actions. I have talked with the farmers that they are busy with fishing work, like smoked fish season in their village or commune to do that every year when there is a lot of fish. They always come back home from other places to get fish in their villages.”



Fishing activities Sdei Ieu village, Prek Luong Commune, Ek Phnom district

18.9 CLIMATE CHANGE AND MIGRATION: A GENDER PERSPECTIVE

While increasing climate variability can have catastrophic consequences on both men and women, the impact on Cambodian women can be heavy. In Battambang, as in other rural sites in Cambodia, rural women face issues such as limited access to education, gender-based violence, and pressure to work while maintaining domestic roles (Spires and Tost 2017).

Moreover, women have less power to influence decision making around how to manage the impacts of climate vulnerability.⁶² In fact, floods and droughts exacerbate women's existing vulnerabilities, such as lower levels of education, income, mobility, health, and power in decision-making (WFP, 2019).

FROM CLIMATE DIARY

“ My name is Sreyroth. I live in Prek Luong village, Prek Luong Commune, Ek Phnom district, Battambang province. Some farmers in my village start to check their rice field after the flood comes down and to keep water for storage in their rice field to grow the rice for more next time.”



Sreyroth, inhabitant of Prek Luong village, Prek Luong Commune, Ek Phnom district

62. <https://asiafoundation.org/2018/04/11/climate-adaptation-strategies-and-the-role-of-gender/>

As the **Asian Development Bank**⁶³ (2011) underlined, environmental “impacts and the use of migration as a coping strategy are far from gender neutral”, oftentimes having a greater impact on women. In rural areas of Cambodia, climate-related vulnerabilities are forcing many people to migrate to urban centres (such as Phnom Penh) or

across borders (most often to Thailand) in pursuit of less environment-dependent income opportunities. As explained during her interview by Mrs. Keo Rath, aged 52 years. She lives in Sung village 1, Sung Commune, Samlaut district, Battambang Province:

“ I have observed increased storms and stronger winds in the village. My groundnuts and soybeans are often affected by too much and heavy rain. Over the last five year, my crops have often been affected by torrential rains, and this is often a loss of the benefit compared with the labour cost and input we invest in the farm. Price of the crop has recently gone down as well. [...] My family borrowed money from Amret MicroFinance Institution (MFI) with 500\$ to recover my production of peanuts and soybeans. Unfortunately, we did not get much production from my planting. So, my husband decided to go to Thailand with our daughter to find money to pay back to MFI I am pitiful and afraid for my husband and daughter to find work in Thailand and get the money to pay back to MFI.”

Mrs. Keo Rath

Marginality is constituted by social, economic and natural environmental factors (Von Braun and Gatzweiler 2014; Chu and Michael 2019), as seen in how Cambodia rural women face incompatibilities between paid labour and care work (Joshi 2020). Many older women are “left behind” while men or sons/daughters migrate elsewhere for work and send home remittances, often to pay back MFI debts.

Many rural families have been affected by rural-urban migration, connected with the rapid econom-

ic development of Phnom Penh and parents seeking employment abroad, mainly in neighbouring countries such as Thailand.

Many interviews revealed that grandmothers were taking care of their grandchildren, when the parents had left to work in Thailand. According to a recent study by the IOM (2019) on “the migration impact on Cambodian children and families left behind”, grandmothers have taken on the primary role of caregivers in 75% of households in Cambodia⁶⁴.

63. <https://www.adb.org/sites/default/files/publication/29090/adb-brief-09-environmental-migration.pdf>

64. <https://www.louvaincooperation.org/sites/default/files/2020-08/Migration%20impacts%20on%20cambodian%20children-MHICCAF%20REPORT.pdf> p. XXVII.

As reported by Mrs. Kuy Rin, 57-year-old widower living in Sung 2 village, Sung Commune, Samlot district, Battambang province:

“ *I stayed at home to take care of my grandson and granddaughter because their parents went to Thailand for a few years and they left the children to live with me. [...] I think migration to other countries is not good because we separated each other between mother and son. My son was not happy because he was separated from his children that stayed with me and had no time to take care of his children.”*

Mrs. Kuy Rin

FROM CLIMATE DIARY: MS. SOTHY SREYROTH, BATTAMBANG PROVINCE



Sothy Sreyroth has lived in Prek Luong village, Prek Luong Commune, Ek Phnom district

“ *Mobility means movement or action from one thing to another or one to one. I think mobility is not good for me and my family because mobility get away from home and children relatives due to rice being destroyed by insects a lot in the rice fields. This is because of climate change and the weather is not regular like before, 10 or 20 years ago.”*

In Cambodia, female migration was not encouraged in the past. However, Derks (2008) points out that now, after years of genocide and wartime “female labour has come to play an essential role in the country’s move toward economic development and modernization”. In line with broader regional - and global - trends, female migration is

an increasing phenomenon in the country. This is due to high demand for domestic work and in the manufacturing sector, along with changing societal trends. Norng Sarim, female, aged 69 years, living in Sung 1 village, Sung Commune, Samlaut district, Battambang Province, explains why her family migrated:

“ So, my daughter decided to go to Thailand to find work to pay back because my family has loaned money from MFI to plant the pepper and durian fruits for a small amount. [...] We are poor and we seek work in other countries. If we work in our home country, we could not earn or do any savings, just enough to survive.”

**Norng Sarim, living in Sung 1 village,
Sung Commune, Samlaut district, Battambang Province**

In recent years, undocumented migration to Thailand is increasing, women are employed mainly in domestic work, the construction sector, and in agriculture (Nurick and Hak, 2019). Recent studies (Derks, 2008; Nurick and Hak, 2019) have documented how female labour migration is starting to have a negative impact on daughters of

migrants. As they are expected to contribute to family income while mothers are away, as well as caring responsibilities in the household, females in migrant families are more likely to drop out of school earlier (Tunon and Khleang, 2013; Organisation for Economic Co-Operation and Development (OECD), 2017).



18.10 IMPACT OF COVID-19

The negative economic impact of the COVID-19 pandemic in Cambodia is significant. At least 1.76 million jobs are estimated to be at risk in the country's three most important sectors: garments, tourism and construction, which together account for 40% of employment (World Bank, 2020a). Returning migrants from Thailand, and households that relied on their remittances, are also likely to face significant income losses and an elevated risk of falling into poverty. An estimated 100,000 migrant workers have returned to Cambodia since the COVID-19 outbreak as of August 2020, as they lost their jobs or employment contracts were terminated. As most are irregular the numbers are likely to be much higher (ILO, 2020). Migrant workers are highly vulnerable, both those who return and those who remain in destination countries as regular migrants are often housed in dormitory housing where risk of infection is high and irregular migrants at risk of detention (ILO, 2020).

Remote interviewees raised several significant concerns as to the impacts of COVID-19 from

both the reduction in funding available to projects addressing climate change and the devastating impact upon household incomes. It was pointed out that for those more than 112,000 Cambodians returning back from Thailand, the problems that led them to migrate, including debt, remain unresolved. When they return home, anxieties around loan repayment can cause people to move again as these people are not included in social protection programmes. As one remote interviewee put it, COVID-19 is like a "double difficulty" for already vulnerable migrant workers in Thailand (Anonymous, IGO, remote interview).

Cambodians in Thailand do not have access to social protection or security and during the pandemic were not able to send money to their families. The border was closed between Thailand and Cambodia, making crossing more difficult and dangerous. Those that return are not eligible for government assistance in Cambodia as they are considered overseas workers.

“ Some people have decided to take the risk to return back to Thailand despite the lockdown. ... people are really scared of the pandemic and worried about COVID-19 infections, but the stomach problem is more important than COVID-19, so when they return home and don't have an income and the MFI asks them to pay back their loan, they are worried about losing house and land, so these are the reasons they take risks to migrate somewhere, inside the country or a higher risk to cross the border to Thailand”

Tola Moeun, Central, remote interview

Fieldwork interviews revealed the heavy price the immobilisation of COVID-19 pandemic is putting on local people. With so many local people de-

pendent upon remittances from relatives in Thailand, the enforced blocking of this movement/income is deeply problematic.

THEMES EMERGING FROM THE RESEARCH

- Intertwining of environmental degradation due to socio-natural causes and climate crisis:
 - Deforestation, caused by
 - clearance for timber by large corporations - often illegally
 - farmers expanding agricultural land
 - corruption and poor forest management/ protection
 - poor implementation of the law
 - Rainfall variability (both floods and droughts) identified as major concerns regarding climate change
 - Lack of adaptive capacity is a large problem
 - Reduced flooding in floodplain
- Consequences:
 - Decrease in crop/fish production for small farmers
 - Perception of not being prepared at all for coping with sudden events
- Debt owing to falling into a cycle of debt with MFI is a major issue, often linked to migration
- The impact of drought and erratic rainfall patterns leaves families facing food and income insecurity
- Gendered dynamics are exacerbated as grandmothers are left with children to care for as parents migrate to work in Thailand. This causes social pressures and difficulties for families
- Migration is mainly due to economic reasons/better life opportunities/lack of jobs. Climate change is not perceived as an autonomous driver of migration, but as one element influencing individual desire/ necessity to find alternative income sources to farming.
 - most people would prefer to stay in Cambodia but maintain there are insufficient opportunities for employment which is why they seek work in Thailand, often not via legal channels which can be expensive and complicated. This exacerbates risks to migrant workers who are more exposed to exploitation.

19. CONCLUSIONS AND SOLUTIONS

Many people in Battambang felt that solutions should involve improved water management and irrigation systems. As well as the importance of community initiatives to share knowledge and monitor illegal deforestation.

“ *The first thing is to regulate the forest clearance, to control those who clear the flooded forest. Second, the need to work together to enhance water availability and irrigation scheme construction with technical support so that we can do better cultivation and improve productivity which may reduce migration. Then educating and raising public awareness on the importance of flooded forests, then technical training on agricultural production. Restoring forest and tree plantation is a very good strategy to cope with future climate change. ... We should work together to conserve forests at the community and village level. [...] At the village level, we need water and technical support from agricultural experts to cope with the uncertainty of climate change. We need regular support and inputs to cope with this.*”

Mr. Voeun Sokcheat, Boeng Tim, Tapon commune, Sangker

Moeu Chandara, an environmental activist also agrees. Replanting forests is seen as an important element in mitigating the effects of the climate crisis, as well as the importance of taking local people’s views into account:

“ *To me, environmental justice means rebalancing development disasters and environment and sustainability. ... We have to include environmental impacts into the process and decision making and make sure that concerns for local people are addressed during the process. So if we want to develop in the right way, we need to include local people’s voices in decision making [...] then it can be sustainable. Like planting trees, we can contribute to a healthy climate so there is no climate crisis so that people can access climate justice so that everyone is involved”.*

Moeu Chandara, environmental activist, remote interview

“ *At village level, we need water and technical support from agricultural experts to cope with the uncertainty of climate change. We do need regular support and inputs to cope with this.*”

Mr. Voen Socheat, Boueng Tim village, Tapon commune, Sangker district

“ I ask the government not to destroy any more forest, to restore the flooded forest, which is the source for biodiversity, and a fish spawning ground. I think most countries are more advanced with industries and factories which emit CO2 to the ozone layers. Thailand has a big impact and for us this is experienced as chemical impacts and environmental problems.

In relation to migration,

“ we need better and cheaper visa access; legal documents; and we need to have documents suggesting our workplaces and factories we work for and to ensure better safety while working in Thailand via work permits in the factories.”

Ms Tong Panha, Bak Rotes

Participants are heavily dependent on livelihoods that are dependent upon the environment and therefore the climate crisis is being keenly felt. Increasingly irregular rainfall, floods and droughts are devastating agricultural livelihoods, making it difficult to make a living. Deforestation is exacerbating problems and leading to a reduction in biodiversity. It is also reducing the fishing catch from the lake and surrounding waters. The flood-pulse aquatic system of Tonle sap is changing due to the climate crisis and human intervention. Debt bondage is a significant problem for rural populations as households struggle to guard against increasing climate variability, and loans are also

used to fund migration. This can create a cycle of debt as most loans are with MFIs which have extremely high interest rates. Migratory patterns depend on specific geographical locations and may be cross-border, predominantly (irregular movements) to Thailand, or rural to urban within Cambodia, as households seek to diversify income streams. Migration is viewed as a necessary means to diversify income owing to lack of opportunities in Cambodia, but the barriers to regular migration pathways, as well as the social difficulties of separation from family, including small children, is also recognised by many people.

KENYA

CASE STUDY 4

KENYA

CASE STUDY 4

Who is the climate migrant? And how can we discuss the complex nexus between the climate crisis and migration in a manner that is productive and beneficial to those whose lives and livelihoods are most at risk from the climate crisis? These are some of the questions that this report grapples with and that have been the focus of much discussion throughout the EU project “**End Climate Change, Start Climate of Change**” (#ClimateOf-Change), co-funded by the European Union’s Development Education and Awareness Raising Programme (DEAR), within which the research is based. Questions that, sadly, as with all things related to discussions on migration, are deeply political in their nature. In seeking to answer them, we draw upon empirical research from four case study countries: Cambodia, Guatemala, Kenya and Senegal. **This section focuses upon Kenya.** Research was conducted by the interdisciplinary research team based at the University of Bologna, drawing upon combined sociological, agricultural and food systems, human-geographical and legal perspectives, together with partner organisations on the ground where we were unable ourselves to visit the case study countries due to the COVID-19 pandemic.

Kenya is recognized as **highly vulnerable** to climate change impacts and a strong rural–urban migration trend is due to various factors including internal conflicts and natural disasters. In particular, drought and floods are causing significant displacement especially among pastoralists who experience frequent loss of livestock and limited access to land, resources, and markets. The use of evictions to realise development and environmental protection projects have also contributed to displacement, driving people off private, public, and communally owned land in both urban and wilderness areas. Although Kenya is considered a lower middle-income country, key challenges continue to be seen in the country’s inequality and poverty levels, which has increased the country’s economic vulnerability to shocks. This may also induce people to migrate either internally, such as to the case study area of Isiolo County, or beyond Kenya’s borders towards neighbouring states or Europe.



Hussein Huka, shepherd from Merti village, standing inside his goat loafing shed ©ArtfulEyesProduction

20. COUNTRY OVERVIEW

Region	Eastern Africa
Population (000)	54 986
Human Development Index	0.601
Ethnic Groups	The largest three groups are Kikuyu (22%), Luhya (14%), and Luo (13%)
Rural population (% of total population)	72,5
Poverty rate (% of total population) ⁶⁵	36.1
Natural resources ⁶⁶	limestone, soda ash, salt, gemstones, fluor spar, zinc, diatomite, gypsum, wildlife, hydropower
Forested area (% of land area) ⁶⁷	6.3
Agricultural land ⁶⁸	48.1% (of which permanent pasture: 37.4%)
CO2 emission estimates (mil. tons/tons p.c.) ⁶⁹	15.9/0,3

The Republic of Kenya, located in Eastern Africa, covers a total land area of 582,646 km², which includes varied formations of plains, escarpments, and hills, as well as low and high mountains. Starting east along the coast, low plateaus run inland (west) to an elevated plateau and mountain ranges, marked by the Kenyan highlands in the southwest corner of the country. Kenya shares borders with Ethiopia to the north, South Sudan and Uganda to the northwest and west, and Tanzania to the south. The country's southeast coastline borders the Indian Ocean. Topographically, the country is

subdivided into two major regions: the lowlands, which includes the coastal and Lake Basin areas; and the highlands, which comprises much of both sides of the Great Rift Valley.

The majority of the population lives in the country's rainfed highlands which also host significant **farmlands**. Highlands are relatively cool and agriculturally rich and are largely dominated by commercial and small-holder farms. Principal cash crops include tea, coffee, flowers, vegetables, pyrethrum.

65. UNDP database (<http://hdr.undp.org/en/indicators/39006#a>).

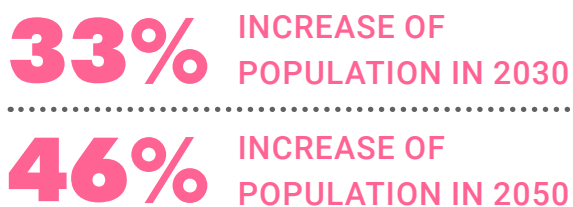
66. <https://www.cia.gov/the-world-factbook/countries/kenya/>

67. UNData- A world of information (<https://data.un.org/en/iso/ke.html>).

68. <https://www.cia.gov/the-world-factbook/countries/kenya/>

69. UNData- A world of information (<https://data.un.org/en/iso/ke.html>).

Wheat and maize, as well as livestock production is also practised across the highlands, which lie at 1,500 to 3,000m above sea level. The Great Rift Valley bisects the highlands into an east and west region forming a steep sided trench of 48 to 64 km wide and 600 to 900 m deep. Kenya also has a diverse natural resource base, which includes forests, wetlands, dry lands, aquatic and marine resources. Kenya is considered a lower middle-income country, it has the largest economy in East Africa. **The urban population is projected to increase** by 33% in 2030 and 46% in 2050 (World Bank Group – Climate Risk Country Profile, 2021).



Kenya is recognized as **highly vulnerable** to climate change impacts and is described as the 39th most vulnerable country⁷⁰. Kenya’s climate is strongly influenced by the Inter Tropical Convergence Zone (ITCZ), which drives rainfall in the country. Kenya is affected by the consequences of the El Niño Southern Oscillation (ENSO) and the Indian Ocean Dipole (IOD) phenomena. ENSO is a global phenomenon and has a warm episode (El Niño) and a cool episode (La Niña). For the north of equatorial East Africa, in particular Ethiopia as well as North Kenya, El Niño is associated with droughts from July to September. For the south of equatorial East Africa, it is by contrast generally associated with rainfall far above normal and subsequent floods during the short rains, from October to December.

During La Niña, the opposite occurs, meaning abnormally wet conditions during July to September for the south of equatorial East Africa, and rainfalls below normal during October to December for the north of the region (Rourke, 2011). Precipitation trends for Kenya are highly variable, however there is significant geographical diversity in observed rainfall trends: northern areas have become wetter, and southern areas have become drier since the 1960s, although this has had a high degree of variability. Extreme rainfall events are occurring with greater frequency and intensity.

This situation is exacerbated by a combination of political, geographic, and social factors (IOM, 2016). For example, floods in the lower Tana River basin area have been modified by upstream dam management, in particular of the Masinga Dam and the Kiambere Dam (Schade, 2011). Land degradation is linked to multiple issues, including state agricultural strategies that are still based on the subdivision of agricultural lands which become overused, thereby reducing their productivity. Subsistence agriculture also degrades land due to unsustainable methods of crop production. Population pressures, coastal erosion, deforestation as well as seasonal variability and climate change also play their part. These pressures also threaten the country’s unique biodiversity, as well as local livelihoods and long-term food security for a significant part of the Kenyan population. Kenya faces key challenges with inequality and poverty levels, which has increased the country’s economic vulnerability to shock (World Bank Group, 2021).

70. Notre Dame Global Adaptation Initiative (ND-GAIN), gain.nd.edu/our-work/country-index.

BOX 1: SUMMARY OF CLIMATE CRISIS IN KENYA

Sudden-onset hazard

Several types of hydro-meteorological disasters (extreme rainstorms, tropical hurricanes, torrential rains) affect most regions of the country and cause floods and landslides. Riverine floods constitute the majority of floods and have the greatest impact. Flash floods in Kenya tend to occur in semi-arid areas, such as Turkana, Marsabit, Makueni and Narok counties. Three main regions are most prone to landslides: Rift Valley, Central Province, especially Murang'a County, and Western Kenya, especially Kakemega County.

Slow-onset environmental change

Slow-onset events (further exacerbated by human activities) comprise droughts (Baringo, Laikipia, Turkana, Samburu, Narok and Kajiado in Rift Valley, Marsabit and Isiolo in Eastern province, Mandera, Garissa and Wajir in North-Eastern and Tana River, Kilifi, Kwale and Taita-Taveta in Coast Province); desertification (in arid and semi-arid lands - ASALs⁷¹); land and forest degradation (Maasai Mau Forest - Narok County); soil erosion (Trans Nzoia and Uasin Gishu counties); and sea-level rise and coastal erosion (Mombasa, Lamu and Manda islands are particularly at risk).

20.1 PASTORALISM IN KENYA

About 80% of Kenya is characterised by **arid and semi-arid lands** with pastoralism as the main source of livelihood to millions of people residing in these lands (Amwata et al. 2015) by contributing 13% of GDP (Nyariki, 2017). Pastoralism is not only considered a livelihood system but is also a cultural identity (Nyariki, and Amwata, 2019). As an economic activity, pastoralism is a livestock production system which takes advantage of the characteristic of rangeland environments and pastoralists traditionally move from one area to another in search of pasture and in search of water for their livestock. As a cultural identity, it plays a critical role in socio-cultural dynamics within the country including source of prestige, wealth, dowry and settlement of family disputes (Nyariki and Ngugi, 2002, Nyariki, and Amwata, 2019). In Kenya livestock production accounts for 50% of agricultural GDP (Nyariki, and Amwata, 2019, Nyariki 2004; Fitzgibbon 2012) which alone represents 20-30% of national GDP (Nyariki, and Amwata, 2019).

In contrast to the population of the mainland, the population of the former Northern Frontier District (NFD)⁷² is still mainly composed of **nomadic pastoralists**. The population living in this area has inherited the "special" treatment imposed by the colonial administration under which no person could move in or out of the area without a pass or special permit. This policy was continued and even extended by the postcolonial government, which ruled the north and north-eastern area by decree, including Tana River and Lamu Districts, because of security concerns in the context of the Shifta War (TJRC, 2013). Even though today there are no longer any official travel restrictions, the local population still faces bias in getting national ID cards or passports, which are preconditions for entering the formal job market in Kenya or to study abroad respectively (TJRC, 2013). Moreover, the infrastructure for mobility is underdeveloped with the Isiolo-Moyale road, currently under construction, being the first tarmac road built since independence that reaches out to the north beyond Garissa town (TJRC, 2013).

71. The ASALs account for approximately 80 percent of Kenya's land mass, covering 29 counties and a population of about 16 million people (UNDP, 2018).

72. During the colonial period, the NFD comprised what is today Marsabit, Moyale, Isiolo, Mandera, Wajir and Garissa counties (the latter includes former Ijara District). The population was regarded as "hostile tribes" and driven by security concerns the colonial administration in 1902 declared the NFD a "closed area".

21. STRATEGIES FOR COPING WITH ENVIRONMENTAL AND CLIMATE CHANGE

In Kenya, the importance of the environment and climate change is reflected in the **Constitution**⁷³ which sets specific obligations with regard to the protection of the environment for the benefit of present and future generations. In particular, art. 70 (Enforcement of environmental rights) states that “if a person alleges that a right to a clean and healthy environment recognized and protected under Article 42 has been, is being or is likely to be, denied, violated, infringed or threatened, the person may apply to a court for redress [...]”. To this end, the State is required to ensure sustainable exploitation, utilisation, management and conservation of the environment and natural resources by encouraging public participation in the management, protection and conservation of the environment. In this regard, **land management represents one of the most crucial issues facing the Government of Kenya**. The Constitution stipulates several provisions to address this, including, setting the minimum and maximum acreage of land that an individual can own (art. 159) and a target to increase Kenya’s tree cover to at least 10 percent of the land mass and pursue sustainable resource exploitation more generally (art. 69).

Pursuant to art. 162(2) of the Constitution and Section 4 of the Environment and Land Court Act, Kenya created the **Environment and Land Court** which has jurisdiction to hear and determine disputes relating to environmental planning, climate change issues and any other disputes related to land and the environment as per Section 13 of the **Climate Change Act**. Responsibility is also given to county governments, where one of the county executive committee members has designated functions relating to the environment and ancillary matters. Apart from the institutional framework, the Climate Change Act also created an avenue for citizens to hold governments and corporations accountable, but only in relation to reducing greenhouse gas (GHG) emissions. Finally, under the new Constitution, all levels of government in Kenya are required to reallocate planned capital expenditures towards financing post-disaster reconstruction efforts with the support of key international donors including the Global Facility for Disaster Reduction and Recovery (GFDRR), the World Bank, the EU and the UN.

73. The new Constitution, enacted on 27 August 2010, replaced the previous one and includes a number of groundbreaking reforms. Some of the most crucial changes concern the devolution of certain powers and prerogatives at local level, the creation of a high chamber of Parliament to monitor the management of local affairs, the land reform, the introduction of a bill of rights - including social and economic rights, as well as rights and duties with respect to the environment - and the establishment of a Supreme Court. Following the adoption of the new Constitution, Kenya is now divided into 47 semi-autonomous counties with their own county governments (consisting of an Assembly and an executive branch) with the Assembly and the county governor being elected directly.

BOX 2: SUSTAINABLE DEVELOPMENT GOALS (SDGS)

The Sustainable Development Goals (SDGs), also known as the Global Goals, form the core of the 2030 Agenda and were adopted by all United Nations Member States in 2015 as a universal call to action to achieve accelerated, high, inclusive, broad based, sustainable economic growth, social economic transformation and development by 2030. The **2030 Agenda for Sustainable Development** also acknowledges the importance of the **African Union Agenda 2063**⁷⁴ and considers it an integral part of it.

In Kenya, the Vision 2030 strategy is directly linked towards achieving the SDGs and implemented through five-year Medium-Term Plans (MTPs). The current and third MTP 2018-2022 aims to achieve accelerated, high, inclusive, broad based, sustainable economic growth, social economic transformation and development mainstreamed the SDGs and AU Agenda 2063 (Macharia, 2019). Despite these intentions, according to the Sustainable Development Goals Dashboard⁷⁵, Kenya is significantly improving SDG 13 achievements (Climate Action) measured through CO2 emissions, while facing major challenges in SGD 15 (Life on land), regarding the protection of biodiversity, the restoring and the promotion of sustainable use of terrestrial ecosystems, like the management of forests, and tackling land degradation. Regarding water (SDG 6 - Clear water and sanitation), Kenya still faces major challenges especially with regard to the use of basic sanitation services and of drinking water services. Instead, access to improved water sources for the urban population is still a major limitation (SDG 11 - Sustainable cities and communities). The COVID-19 pandemic is threatening to reverse the progress that has been made over decades towards reducing poverty and improving socioeconomic outcomes.

74. The African Union Agenda 2063 is a shared strategic framework for inclusive growth and sustainable development – was developed through a people-driven process and was adopted, in January of 2015, in Addis Ababa, Ethiopia by the 24th African Union (AU) Assembly of Heads of State and Government, following 18 months of extensive consultations with all formations of African society.

75. Sustainable Development Report 2021.



BOX 2: THE CLIMATE CHANGE ACT

Adopted in 2016, the Climate Change Act aims at providing a regulatory framework for an enhanced response to climate change, and to provide mechanisms and measures to improve resilience to climate change and promote low carbon development. The Act adopts a mainstreaming approach, provides a legal basis for climate change activities through the **National Climate Change Action Plan**, and establishes the **National Climate Change Council** and the **Climate Fund** (Mallowah and Oyier, 2022). Party to the 2015 **Paris Convention**, Kenya submitted its Updated Nationally-Determined Contribution to the UNFCCC in 2020, in support of adaptation and mitigation efforts, to improve the country's ability to prepare for and respond to natural disasters and increase its resilience to climate change. Additionally, Kenya aims to become a **newly industrialised** country by 2030, which will require expanding climate change resilience efforts while also increasing its domestic energy production and the use of renewable sources. Kenya's Disaster Risk Management (DRM) Authority is working at both national and sub-national level to implement actions outlined in its **Vision 2030 strategy**⁷⁶ especially in the phase of preparedness and response. It has also involved academic researchers in the process in an effort to better prepare for climate change adaptation (Kahiga et al., 2015).

In addition, the Climate Change Act provides the overall governance structure for climate change in Kenya, and supports development and implementation of measures and mechanisms that will enhance climate change resilience (through adaptation) for the sustainable development of Kenya. This includes actions to support the **adaptation of pastoralist** communities to the impacts of climate change. The CCA is the main mechanism allowing national government and county governments to take climate change actions. Section 19 of the CCA requires county governments to implement climate actions through County Integrated Development Plans (CIDPs) which are intended to be developed in a participatory manner, including engagement with local communities. The main aim of the Council was to develop economically marginalised counties which suffered fragility, instability, and several natural disasters, such as droughts and floods. The decision to involve county governments is fundamental since they are the only ones capable of devising methods for pastoralist communities to make contributions to the development of CIDPs, to identify climate change interventions that are suitable and relevant, in most affected areas, such as the ASAL areas (Kogo, 2021).

76. Kenya Vision 2030 is the country's development programme from 2008 to 2030 launched on 10 June 2008 by President Mwai Kibaki. Its objective is to help transform Kenya into a "newly industrialising, middle-income country providing a high quality of life to all its citizens by 2030 in a clean and secure environment." Further information is available at vision2030.go.ke.

21.1 NATIONAL (ENVIRONMENTAL) MIGRATION POLICY

In Kenya, **the right of movement** is ensured by art. 39 of the 2010 Kenya Constitution according to which “every person has the right to freedom of movement; [...] the right to leave Kenya; [...] [and] the right to enter, remain in and reside anywhere in Kenya”. There are different “pending” initiatives, such as the **2018 Draft of Kenya Migration Policy** and the **2010 Kenya Labour Migration Policy Draft** which have the general objective of enhancing socioeconomic development and security in the country through the advancing of institutions and operational frameworks for effective migration governance. In particular, the Draft on Migration identified specific objectives, including “[...] address[ing] the challenges of irregular migrants and forced displacement by strengthening migration development and management; promote migrants’ rights by protecting victims of smuggling and trafficking in persons and other vulnerable migrant groups [...]” (IOM, 2018).

Whilst Kenya does not have a specific law regulating environmental migration, it does have a policy framework studded with laws, initiatives and actions related to the phenomenon of migration linked to environmental and climate issues. The most relevant is the **Prevention, Protection and Assistance to Internally Displaced Persons and Affected Communities Act of 2012** which gave effect to the Great Lakes Protocol and the UN Guiding Principles on Internal Displacement. In particular, it states that “internally displaced persons” is “a person or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, large scale development projects, situations of generalised violence, violations of human rights or natural or human-made disasters, and who have not crossed an internationally recognized State border”. This Act applies both to disasters and conflict and establishes a monitoring and reporting system in areas where people are at risk of displacement. In particular, art. 5(4)

affirms that “the Government shall establish a prevention mechanism charged with monitoring areas inhabited by persons at risk of displacement, periodical reporting on the situation in such areas [...] for further action to prevent internal displacement”.

In 2010, the **National Climate Change Response Strategy (NCCRS)** was adopted, and clearly identified that climate change may lead to displacement and migration of populations from disaster-prone areas. The NCCRS was followed by the National Climate Change Action Plan 2013-2017 which was developed to operationalize the NCCRS. The Action Plan highlighted some of the consequences of climate change in Kenya (droughts, frost in some productive agricultural areas, hailstorms, extreme flooding, receding lake levels, and drying of rivers and wetlands, etc). It was even noted that these extreme events had led to the displacement of people and migration of pastoralists inside and outside the country (IOM, 2018).

The existing nexus between migration and climate change was recognized in the **2012 National Policy for Sustainable Development of Northern Kenya and other Arid Lands**. Of the more relevant policies are those that prioritise the necessity to “**protect and promote the mobility and institutional arrangements in pastoralism**”, and how to ensure food and nutrition security across the ASALs “where unpredictability is certain to increase as the impact of climate change deepens”. In particular, the Policy stressed the need for restrictions on livestock mobility as a key policy constraint: “The primary policy challenge is how to protect and promote mobility and, in line with the constitution, support the customary institutions which underpin pastoralism in a society which is otherwise sedentary and tending towards more individualised modes of organisation and production”.

BOX 4: ENVIRONMENTAL MIGRATION IN THE KENYA VISION 2030

The Kenya Vision 2030 refers to migration in the Second Medium Term Plan 2013–2017. Under the section on ending drought emergencies, the **link between migration and the environment** is stated affirming that “competition between communities over natural resources increases insecurity ... [which] in turn increases vulnerability to drought, by impeding migration, curtailing access to services and resources, destroying assets, and damaging intercommunal relations”. Also, the Section on the environment recognizes the relationship between migration and the environment stating that “land degradation leads to socioeconomic problems such as food insecurity, insufficient water, regular loss of livestock, limited agricultural development and outmigration, specifically from rural areas. References on the nexus between environment and migration are also detectable in the Section on population, urbanisation, and housing, but also in relation to infrastructures, governance, and rule of law. notably, in the Third – Medium Term Plan 2018-2022 there is no such explicit recognition (IOM, 2018).

At the regional level, Kenya is increasingly working with regional entities. It has become a member of the **2006 Pact on Security, Stability and Development in the Great Lakes Region** (the Great Lakes Pact) which contains a Protocol on internally displaced persons based on the Kampala Convention’s Guiding Principles on International Displacement (GIDPs). Indeed, Kenya is one of the States Parties which expanded the definition, therefore, welcoming migrants coming from Somalia.

Recently, in the context of the African Union, Kenyan participated in the Inter-Governmental Authority on Development (IGAD) which led to the approval of the **2012 Regional Migration Policy Framework for Africa (MPFA)** on the linkages between migration and pastoralism, migration and human security and internal displacement and political stability. In particular, priority n. 5 (“effective migration governance to counter- transnational threats and international crimes”) outlined the existing nexus between climate change and migration and the impact of migration on the environment (Action 7). In addition, all IGAD coun-

tries adopted the **Protocol on Free Movement of Persons in the IGAD Region in 2020**, according to which persons affected by disasters will have the right to seek protection in neighbouring countries and the entry and lawful stay in the region for those who are displaced is facilitated. In this context, there are different initiatives, such as Kenya’s ratification of the 2018 Treaty Establishing Free Movement of Persons, Right of Residence and Right of Establishment - which set the ground for easing the challenges of cross border migration, including for those that migrate because of gradual environmental changes - and the African Continental Free Trade Area (AfCFTA) - which Kenya incorporated in March 2021.

Kenya is also a recipient of the **EU Emergency Trust Fund for Africa** which, although not without its critics, has the stated aim of fostering stability and addressing root causes of displacement and irregular migration, while providing support and creating economic opportunities for long-term refugees and their host communities.

BOX 5: EU EMERGENCY TRUST FUND FOR AFRICA

In April 2015, the European Council decided to call for an international summit to discuss migration issues with African states and other key countries. The summit took place on 11 and 12 November 2015 in Valletta (Malta). It resulted in a common declaration and an Action Plan built around 5 priority domains and 16 priority initiatives. In addition, on 12 November 2015, 25 EU Member States, Norway, Switzerland and the European Commission signed the **Constitutive Agreement**⁷⁷, officially establishing the EU Emergency Trust Fund for stability and addressing root causes of irregular migration and displaced persons in Africa with its accompanying strategy. It is aimed at fostering stability and helping to better manage migration by addressing the root causes of destabilisation, forced displacement and irregular migration. It supports activities in 26 countries across three regions of Africa (referred to as 'windows'): the Sahel and Lake Chad, the Horn of Africa and North of Africa⁷⁸ (Castillejo, 2016).

77. The Constitutive Agreement is a document drawn up by the European Commission, EU Member States and other donors.

78. For insights, see EUTF 2020 Annual Report, https://ec.europa.eu/trustfundforafrica/content/about_en



22. METHODS

Information in this chapter is taken from a combination of different methods and research phases. A desk analysis of scientific and grey literature was integrated with empirical data collected via fieldwork focus groups, climate diaries, semi-structured interviews and a household survey conducted by the WeWorld team located in Kenya between October and November 2021. Target groups were local households that moved to Isiolo county over a period of between 1 month and 5 years ago and are affected by the climate crisis. The aim was to examine the lived experiences of climate change impacts on the pastoral population of Isiolo. For further details see Methodology section.

- **A one-month climate diary** (Giacomelli and Walker, 2021): 30 participants (Merti sub-county and Isiolo sub-county).
- **Focus groups:** 2 groups (7 people each, gender and age diverse), 1 in Merti sub-county, 1 in Isiolo sub-county.
- **In-depth interviews:** 10 participants (Merti sub-county and Isiolo sub-county).
- **Household surveys:** 200 households, male and female, from 18 to 65 years old, representative of the rural population of Merti sub-county having experienced climate change and/or having one migrant member within the Household.



A one-month climate diary

30 participants



2 Focus groups

of 7 people each

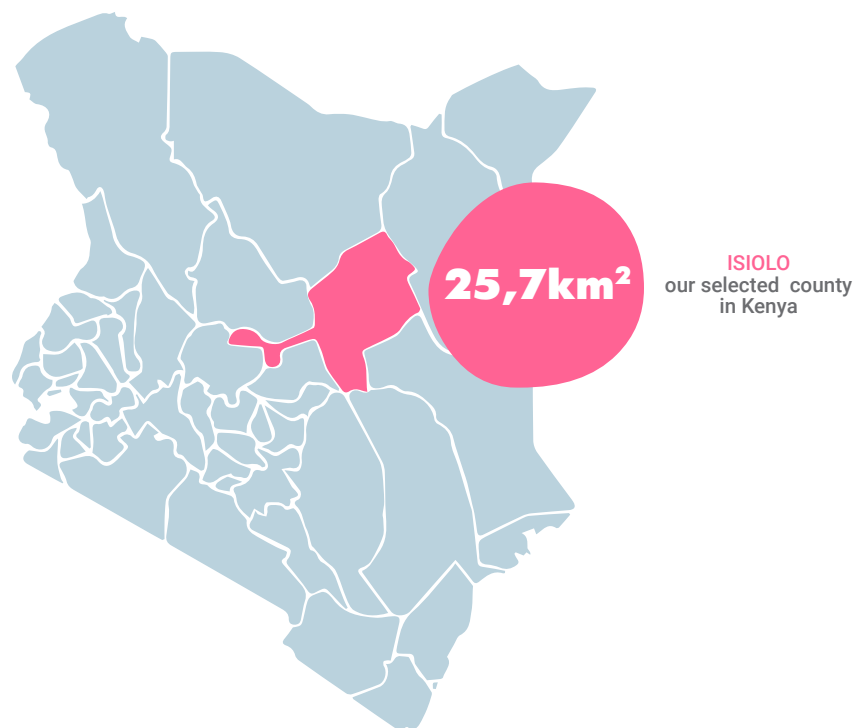


10 In-depth interviews



200 household surveys

22.1 FOCUS: ISIOLO COUNTY



Isiolo County was chosen as a case study because it is both a destination of internal migration and a locality suffering environmental degradation due to extreme events, especially drought. Moreover, the presence of WeWorld in the field facilitated the data collection.

Isiolo County covers an area of approximately 25,700 square kilometres (km²) and is located in the lower eastern region of Kenya. It has the smallest population among Kenyan counties with groups of Turkana, Borana, Meru, and the Somali people. Principal urban centres are Isiolo, Garbatulla, Modogashe, Kinna, Merti and Oldonyiro.

The county is characterised by arid or semi-arid low plains with six perennial rivers that cross through the county and partly bind it. In particular the semi-arid areas have become places for sedimentarized agro-pastoral activities.

The weather is hot and dry in most months of the year with two rainy seasons. The short rain season occurs between October and December with the peak in November while the long rain occurs between March and May with the peak in April, with strong differences within the county according to the topography (CDIP, 2018).

The economy of the county is based on the livestock sub-sector (cattle, goats, camels and poultry) which employs more than 80% of the population (CDIP, 2018). Nomadic pastoralism is prominent and defines not only the means of survival in terms of livelihood but also the lifestyle of most of the county's inhabitants (see below). Isiolo is one of the counties earmarked for development under the Kenya Vision 2030 programme with plans to develop Isiolo town into a 'resort city' to boost tourism to the area.

79. <https://www.hagomitarea.com/contenido/ciencias-sociales/departamentos/departamento-de-totonicapan/>

23. RESEARCH FINDINGS

The following sections briefly report the main findings of the qualitative research⁸⁰ combined with the results of the desk analysis. The findings have been grouped into overarching themes re-

lating to the impact of the climate crisis and the nexus with migration: hostile environment; internal conflicts for natural resources; adaptation to climate change for (im)mobile people.

23.1 HOSTILE ENVIRONMENT

“ Climate Change is related to food insecurity, lack of income and starvation of livestock because of droughts”.

Abuya

“ Environmental issues in Kenya can be linked to three different phenomena: drought, water and health”.

Judith

Isiolo’s Integrated Development Plan (2018-2022) recognizes that the county is one of the most vulnerable counties to climate change in Kenya. The county has a generally hot and dry climate throughout the year and **has recently suffered a severe period of drought that has affected the whole population’s livelihood**⁸¹. In February 2017, the National Drought Management Authority (NDMA) indicated that up to 80,000 residents of the county needed food aid as a result of drought, and cases of conflict over water and pasture were reported during the period as a result of the scarcity of the two resources.

Although drought and heat stress remain the main hazards for the county, the occurrence of intense precipitation does sometimes result in flash floods, especially in the low-lying plains. Drought and unpredictable rainfall impact negatively on crop yield, livestock productivity and livestock mortality, causing loss of income for farmers, and consequently food security issues. Additionally, other human-led activities like charcoal burning, sand harvesting, overgrazing and overstocking are depleting vegetation cover leaving land more exposed to soil erosion.

80. The survey was delivered in paper form in December 2021. Digitalisation of data and data cleaning are still ongoing at the time of writing. Quantitative results from the survey are therefore not included in this chapter but will be integrated later on in 2022.

81. The National Drought Management Authority issues monthly reports on the impact of drought in Kenya. For insights on Isiolo County, see <https://www.ndma.go.ke/index.php/resource-center/category/15-isiolo>.

CLIMATE DIARY: ALI GUYO



“ The change in climate instigated a shift in rainfall distribution and high temperature which has dried up water sources. This has caused adverse effects on animals and humans, as it makes water scarce. The pastoral community has to walk long distances in search of water”.

River bed, Isiolo County

CLIMATE DIARY: ALI GUYO



“ This was a pan with water some years ago, climate change accelerated the rate of evaporation causing this accessible source to dry out. Water that once spread across an expanse of land was gone, communities may have limited access to water for household use, including drinking, cooking, cleaning, and watering animals. In the long run, if adaptive measures of water harvesting and protecting sources are not adopted, droughts may lead to higher water costs, rationing, or even the decimation of important water sources”.

Dried land, Isiolo County

CLIMATE DIARY: YAPAR PETER



“ Desertification is growing fast around this area of Burat, Isiolo in Kenya. Imagine, this was a permanent river with a lot of crocodiles ten years back, now it has dried up and has nothing to feed livestock.”

Dried river bed, Isiolo County

As emerged from respondents' climate diaries, there has been a remarkable variation in the climatic conditions in Isiolo County over the past few years. The most common changes cited include warmer temperatures, unpredictable rainfall, water scarcity and prolonged drought periods. In terms of perceptions of long-term change in climate, an overwhelming majority of farmers and pastoralists perceived an increase in average

temperatures and a decrease in average precipitation. The effect of climate change has seen an increasing number of families lose their entire herds to droughts, forcing them to settle for relief food. The heat stress suffered by animals also reduces the rate of animal feed intake and results in poor growth performance and low production of milk and meat.

CLIMATE DIARY: HASSAN HUSSEIN



“ A small boy fetching water using donkeys...inadequate supply of water.”

Boy fetching water, Isiolo County

CLIMATE DIARY: SAFIA MAICHA



“ Because of the drought in our area the animals move far from one place and other to look for pasture and water and some of our animals were dying because there is no rain in our area.”

Livestock, Isiolo County

According to respondents, over the last 5 years, dry and wet seasons have shifted, seasonal cycles have become less regular, rainfall distribution has changed and there is a perception among pastoralists that overall precipitation has declined. Rain precipitation levels, and the climate risks associated with them, vary greatly over time and geographical area, and as such, they are a significant influence on livestock population dynamics, herd composition and vegetation. In particular, **pastoralists have experienced the increasing effects**

of climate change. Indeed, climate change-related events like drought result in starvation for animals and food shortage for people. Hence, pastoralists, and the agriculture sector, are the most vulnerable to climate change and the livelihoods of around seven million pastoralists have been jeopardised by the cumulative impacts of more frequent drought on livestock losses (approximately 80% of losses in the last droughts), and consequently rising cereal prices and lower returns when they sell or trade their animals.

“ Today, the drought has worsened because there is less rain and the soil is becoming dry”.

Sarah

The lack of food and water is affecting people's survival.

For pastoralists, the lack of water represents a serious problem as it means they cannot sustain their livestock. As an interview reported, this not only impacts the family budget but also the **education of children**: when farmers cannot produce enough, they do not have money to send children to school and support their education.

For these reasons, many pastoralists decide to migrate both towards other lands or to towns. As

pastoralists use mobility as a basic strategy for their livelihood development and risk management systems, climate change is making it difficult to predict where and when to move. For example, they move with their livestock in response to drought, so every time there is climatic stress – which manifests itself in failure of the rains – pastoralists traditionally migrate, following the rains. **Pastoral communities are by nature adaptable, innovative and equipped with traditional knowledge and customary coping strategies to survive in times of drought.**

CLIMATE DIARY: PAUL LOTIENG



“ This is what cattle are suffering as they try to find grass in this field.”

Livestock, Isiolo County

23.2 INTERNAL CONFLICTS FOR RESOURCES

Participants in the Focus Groups (Urban) reported serious situations of insecurity in some areas of Kenya, such as Turkana County. Indeed, since Kenya's independence in 1963, political, ethnic, and land-related violence, disasters and development projects have all repeatedly triggered internal displacement (IDMC, 2015). In the aftermath of the 2007 Presidential elections, the ensuing political violence compelled 664,000 people to abandon their homes: 1300 were killed, about 350,000 people were relocated to 118 refugee camps while 300,000 people found shelter with host communities or in rented accommodation in urban and peri-urban areas (OHCHR, 2012). Generalised violence has continued to cause new displacement since then.

Against this background, in the regions bordering

Isiolo the effects of climate change are exacerbating the conflicts arising among local communities because of the progressive lack of resources (A. Paul et al., 2022; F. Maelo, 2021), especially of water due to widespread drought that remains a significant concern to the agricultural sector. According to participants, conflicts have reduced crop farming and livestock, affecting market business and also the educational progress of children, thus pushing people to move towards other territories. Turkana County remains an area of protracted resource disputes. The persistence of conflicts and violence prevents people from returning to their territory of origin.

Many move to Isiolo to escape this. Indeed, Isiolo is perceived as a safe place to live, despite the initial prejudices towards those migrating from Turkana County and other neighbouring regions:

“ At first, Isiolo people did not appear really welcoming but once I demonstrated the potential added value of my person for the community, they started to appreciate me”.

Judith

23.3 ADAPTATION TO CLIMATE CHANGE FOR (IM)MOBILE PEOPLE

“ Climate change is mainly due to human activities resulting in high levels of air pollution. In addition, people are cutting trees and mismanaging the soil thus demonstrating not being able to respect the environment and nature”.

Judith

For some interviewees, the main responsibility for climate change lies with high-income countries. However, many also maintain that the Kenyan Government is not doing enough in either practical or educational terms: for example, the grass seeds granted are not sufficient for pastoralists

and, moreover, it is not adopting suitable strategies for educating the community. Further, participants maintain that the Government is not active in making people accountable and responsible for their behaviour:

“ Human beings are mainly responsible for climate change”.

Steve

However, the County Government is perceived as a little more engaged in helping people cope with climate change effects, for example by planting trees and providing for water (e.g. improvement and maintenance of boreholes).

However, according to interviewees, increased information and education on new techniques for farming as well as the provision of financial assistance are needed to guarantee major resilience.

“ There are women groups to support the environment, the municipality comes and promotes environment protections and the community is taking up and not destroying the environment as before”.

Abibi

CLIMATE DIARY: AMOS OTIEGO



“ So today I was in Kina, Isiolo County, and visited a group of women who after losing their livestock because of drought and conflicts in their original homes, migrated to Bisanadi and began a self- help group. Instead of doing large farming, they decided to do small kitchen gardens. They began growing tomatoes and kales, selling them to the locals and earning money. After getting some considerable amount of money, with help from well-wishers, they built a fish pond, and also started poultry farming. This is because they could no longer rely on livestock farming after being affected by climate change.

Farm plot, Isiolo County

People are struggling to cope with and prepare for the effects of climate change, especially droughts.

“ When we talk about agriculture and preparedness we have to talk about water storage”.

Judith

Much work is being done by local activists to help people adapt to climate change. The main adaptation strategies used in Isiolo to cope with or mitigate against risks associated with agricultural production and food security include the use of **drought resilient crop varieties** and afforestation⁸². For example, respondents made multiple

references to the so-called “food forest”, a place where people can cultivate indigenous edible plants and trees, such as bamboo and moringa, that are resilient to drought. With the support of local NGOs, livestock keepers construct water pans, drill boreholes or keep more resilient livestock, such as camels, local chickens and goats.

“ When there is no water you can think about another idea about your activity”.

Judith

⁸². The notion of afforestation is different from that of reforestation. Afforestation means converting long-time non-forested land into forest and refers to the establishment of forests where previously there have been none, or where forests have been missing for a long time. Instead, reforestation refers to the replanting of trees on more recently deforested land.

Indeed, preparedness is perceived as a decisive step which also means avoiding migration

“ If people learn to be prepared, it is not necessary to migrate”.

Judith

CLIMATE DIARY: YAPAR PETER



“ Pipe water for better irrigation instead of farrow method”.

People setting irrigation system, Isiolo County

“Do you think it [climate change] changed your life?”

“ I know it [climate change] is affecting my life. The migration all the way from Wagia to Isiolo, it cost me a lot to move, in terms of insecurity and in terms of [monetary] costs. I didn't have money to move animals, we walked for three weeks. The family supported me in the process – they rented a car for my children and luggage. During the journey it was difficult because of bandits on the roads that wanted the animals.”

Abibi

The main features of mobility amongst participants can be described as consisting of **nomadic pastoralism**, a strong rural–urban migration trend, internal displacement due to various factors namely political violence, natural disasters and forced evictions due to development and conservation activities. Migrant pastoralists usually arrive in Isiolo with the whole family and already

have relatives and acquaintances in the county that provided information prior to the journey. In some cases, respondents perceive migration to nearby countries or higher-income States that have developed strategies especially against drought (such as Israel) as a temporary solution for earning income to finance adaptation strategies when returning to their lands.

“ I would like to go to Israel to learn about their farming techniques and how they adapt to climate change. Then, to come back to Kenya and spread my knowledge”.

Judith

“ I would like to go to Tanzania because there is a lot of business, a lot of farming and the living standards are very high. I went there with a government program. They do things differently there”.

Abibi

According to the majority of interviewees, neighbouring countries should not necessarily guarantee protection to climate migrants because they also have a lot of challenges.

However, they felt people should be treated according to a humanitarian and cooperative approach.

“ Not open the borders but to cooperate for protecting vulnerable people”.

Judith

While migration is not the first adaptation strategy for most respondents, migration patterns among pastoralists are shaped by historical and recent developments of the country’s socioeconomic structure and related policy interventions. As agriculture and pastoralism have been the basis of

Kenya’s economy for a long time, and still are the dominant sources of livelihood, it can be held that mobility for respondents has always been related to the Kenyan climate especially in arid and semi-arid areas.

THEMES EMERGING FROM THE RESEARCH

- Rainfall variability (especially persistent droughts) is identified as the major concern regarding climate change.
- Environmental degradation is recognised in the increased deforestation.
- People most affected by these conditions are pastoral families that in the last 5 years have seen their livestock decreasing and decided to move in search of water and pastures.
- The loss of livestock usually causes a severe decrease in the income of the family, an increase in food insecurity and children are forced to drop out of school.
- The journey to move livestock from one county to another is often perceived as very risky because of lack of food, wild animals and robberies.
- Migrant pastoralists usually arrive in Isiolo with the whole family and already have relatives and acquaintances in the county that provided information prior to the journey.
- The search for better living conditions and opportunities is always behind the reasons to migrate even though lack of rain is acknowledged as the cause of deteriorating living conditions.
- Kenya has developed a number of strategies for coping with environmental issues and migration, especially with regard to land management, but major effort is made by the Counties and the local governments (especially in Isiolo) as well as by activists.



Herd of cows coming from a water source in the area of Merti village. ©ArtfulEyesProduction

24. CONCLUSIONS AND SOLUTIONS

More frequent and prolonged droughts and variable rainfall have major consequences for the environment and the livelihoods of the research participants who are heavily dependent on crop production and pastoralism. The effects of such extreme events impact food security and nutrition, and ultimately also children's education as family income decreases as there are insufficient funds to cover the costs of attending school, such as books or uniforms. However, Isiolo County is at the same time a destination area for those migrating from other territories at risk, such as Turkana County, where conflicts over resources are frequent.

To cope with such challenges and to meet the SDGs, the local people involved in the case study seem to be more prone to resilience-building interventions going beyond conventional emergency response strategies, seeking to build a long-term vision for addressing the underlying

vulnerabilities. Cross-border migration is not perceived as a long-term solution; rather, for some of those interviewed, it could represent a way to get best practices and good examples of coping strategies from more resilient countries to then reproduce them in Isiolo.

At a governance level, ultimately, the enhancement of a broader governance mechanism, as well as the formulation and implementation of county-level climate change action plans grounded on assessment of local needs and resources could represent an important step towards the operationalization of the country's climate strategy. At the same time, the implementation of the IGAD Protocol envisaging the development of safe and legal migration pathways towards other countries for the exchange of professional competences and skills would be desirable in order for migration not to be a definitive solution but a proactive strategy.



25. ALETTA MANEMANE CLIMATE DIARY



Selfie: Hi Aletta Manemane from Isiolo - Kenya with my son and grandmother.



Q1 Photo1: Farmers are facing water challenges. These seedlings are drying up due to lack of water.



Photo 2 This is the conflict between wild and domestic animals. Due to the drought the wild animals are killing the weaker animals for their survival that's elimination for the weakest and survival for the fittest. They store the carcass on a tree for the next day.



Photo 3: This is one of the schools where youth are training student to plant trees to reduce scarcity of trees art list one seedlings tree for a student as his duty.



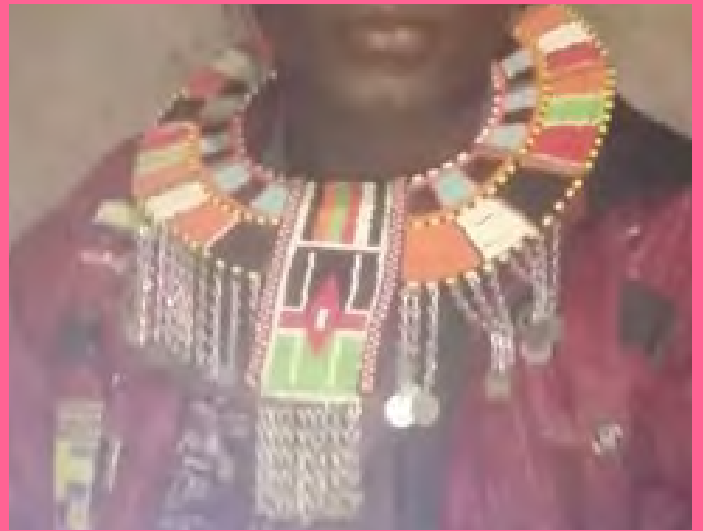
Q2 photo 1 This is 2020 December when there was a lot of rain and enough food every body.



Photo 3 Life turn different: no food no water in the river for farming. People are staying without food and animals die.



Photo 4 Life turn different: no food no water in the river for farming. People are staying without food and animals die.



Q3 photo 1: Due to climate change to help make sure youth are not left behind we make this neck ring as our income generation activity.



Photo 2: We decided to use seminars as opportunity for our product marketing.



Photo 3: This last photo is peace security meeting where youth are mostly used mostly operate as peace ambassadors also we take advantage to market our product.

CONCLUSIONS

FOUR COUNTRIES, COMMON PATTERNS AND
HETEROGENEOUS EXPERIENCES



CONCLUSIONS: FOUR COUNTRIES, COMMON PATTERNS AND HETEROGENEOUS EXPERIENCES

Often portrayed as a future crisis, this report outlines how **the climate crisis is instead a powerful phenomenon in the here and now of the everyday lives** of our participants in Cambodia, Guatemala, Kenya and Senegal. Yet, this force is not purely 'natural', but instead intertwined with structural political, economic and cultural factors that worsen the impacts of the climate crisis upon everyday lives. The climate crisis today is impacting landscapes that have already been significantly restructured by the processes of neoliberal agriculture and colonialism (Parenti, 2011). It is important to stress here that those who participated in this research project are people who are particularly exposed to the impacts of the climate crisis in the selected countries as their livelihoods are heavily dependent on the environment (agriculture, predominantly rain fed, or artisanal fishing). Thus, they are far more exposed to the impact of the climate crisis. There is a growing threat from climate change to community and individual livelihoods, and yet States are failing to address this threat.

As research findings show, climate change is perceived to increase the variability of weather patterns and, hence, the unpredictability and intensity of the weather. This is particularly evident in irregular rain-patterns and related extreme events resulting in slow or sudden climatic events, such as drought and flash floods. Uncertainty about seasonal rainfall also impacts water availability and quality. In Guatemala and Senegal in particular this also causes problems with waste disposal, especially in urban areas. For example, an increase in extreme rainfall events is likely to stress stormwater management systems, leading to the increased likelihood of plastic spilling into rivers and the sea.

At the same time, **the negative impact of human activity stems from the mismanagement or overuse of natural resources** leading to deforest-

ation (illegal logging in Cambodia and Guatemala), desertification (in Senegal and Kenya) and disruption of ecosystems, such as the mangrove forests close to the Senegalese coast. Fishing in Senegal is being devastated by the climate crisis, but also waste mismanagement, pollution, and ocean grabbing. Flooding in Cambodia is both caused by erratic rainfall and the intensity of rains, but also poor infrastructure and damming projects further down the Mekong River, mainly by China, but also Laos, worsening the impacts of the climate crisis. Land grabbing emerged as an issue in all four case studies, with some country-specific issues: in Cambodia the phenomenon is characterised by rich locals, as well as Vietnamese, and Chinese companies, in Guatemala it is driven by mono-culture expansion.

The impact of the climate crisis is intertwined with intersectional factors, such as age, disability, being part of an indigenous or minority group, or having a lower income may also influence the degree of impact. Age is a key factor. All case study countries in this report have very youthful populations and it is the youth that are remaining without hope and opportunities, and youth that seek to migrate to assist their families and/or for personal aspirations. **Climate change can be understood then as a multiplier of pre-existing vulnerabilities**, such as poverty, lack of resources, and food insecurity, that interact with and influence each other. Drawing upon anti-racist and intersectional perspectives in analysing the climate crisis and migration enables the underlying historical causality and the entangled nature of inequalities to be exposed, drawing attention to the interconnecting nexuses of the capitalist extractive economy which feed into the climate crisis and its unequal impacts globally. The capitalist extractive economy is based on the intensive extraction of minerals and other natural resources, from territories that were previously colonised, primarily for export in a global economy that dis-

proportionately benefits nations, transnational corporations and consumers in the global North. Extractivism is closely linked to global patterns of uneven development and wealth distribution, established since colonial times, and which still continue today.

In Guatemala and Cambodia opposition to illegal logging and land grabbing is heavily repressed; human rights defenders and environmental activists continue to face harassment and intimidation, including arrest. In Guatemala there is a serious degree of horizontal (and vertical) inequalities across ethnic divisions, the Maya in particular face severe discrimination and exclusion. Since indigenous people live mainly in rural areas and base their livelihood on subsistence farming, they are also the most exposed to climate change impacts.

Mobility patterns vary immensely and, as case study evidence shows, **the decision-making process in migration is complex and multicausal**. At the micro level the most important drivers influencing migration are economic (food and livelihood insecurity, income and credit access) and socio-cultural (personal aspirations and characteristics like age, gender, ethnicity, skills and education). At the meso level, the economic drivers linked to migration were accessibility to job markets, agricultural productivity and the lack/presence of infrastructures. Narrative and media discourses, migrant networks and the socio-political conditions of the countries were also relevant for participants. The macro level was raised in relation to mobility options. Some evidence was provided on the role of the supranational context (especially the bilateral relations of the four countries with neighbouring countries). The (non)facilitating factors of mobility, such as difficulty accessing visas for work abroad, as shaping patterns that have historically characterised the migration flows of the four countries were also raised.

In sum, as a vast body of scientific literature has demonstrated, the climate change and migration

nexus cannot be recognised in absolute terms. Rather, environmental factors - that exacerbate levels of personal vulnerability - are intertwined with other drivers that, depending on the country in question, emerged as more prominent than others. Results, particularly from remote interviews, confirmed that **a real and effective implementation into effective national policies of existing binding instruments and guidelines adopted at the regional level is often lacking**, thereby decreasing the level of protection of vulnerable people.

In all four case studies, **climate change was considered a symptom not cause of difficulties**. Further, its weight in the migration decision-making process varied across countries and individuals. For example, in Kenya, with respect to the other three countries, climate change played a stronger role in decision making due to the specifics of pastoral conditions. In general, migration itself is perceived as an adaptation strategy for participants and as a way to improve personal living conditions as well as those of their families thanks to remittances. However, it was recognised that this was often in the absence of other possibilities. Additionally, many spoke of the difficulties of migration, particularly the separation of families. These are places where making a livelihood otherwise is increasingly difficult, hence migration is seen as the only way to make a living. Indeed, whilst it might not be possible to identify direct casualty, it is evident that the climate crisis both directly and indirectly shapes human mobility and that the negative impacts of the crisis are increasing. Further, in Senegal, rural migrants move from internal regions of Senegal towards Dakar and other coastal urban areas to find employment as agricultural livelihoods are being devastated by a combination of the climate crisis and socio-political causes. Yet, Dakar and Saint Louis are themselves exposed to significant climate fragility. Hence, we see how patterns of movement are deeply complex, and may also be towards climate risk in urban areas.

The climate crisis interacts with pre-existing and traditional migratory movements.

Populations based on pastoral nomadism, such as in Kenya, are prone to move cyclically or periodically to find pasture for their animals. The traditional porosity of borders between Cambodia-Thailand and Guatemala-Mexico is well known, although migrants may face difficulties and exploitation in gaining paperwork or traversing borders legally. In both situations, however, the effects of climate change reduce capacity to adapt livelihood strategies both for human beings and animals and thus incentivise more people to migrate via historical or new routes. This also explains why migration pathways are multiple, generally supported by travel tales, internal or external opportunities, depending upon the national and regional context. Moreover, migration is not usually linear, but it can also be two-step: from rural to urban and then from urban to third countries. Indeed, regional relationships play an important role in determining regular and/or irregular patterns of migration. The four countries, each belonging to a different macro-region, are all influenced by the relationship with different international actors. In Senegal international relationships are influenced by France, in particular, but also the EU; Guatemala is deeply influenced by the USA, while Cambodia is in the Chinese area of influence. In addition, Cambodia is heavily influenced by international donors, while Kenya has strong connections with the EU. When movement is cross-border, determination of migration pathways is influenced by many factors, including the legal framework on migration of destination states that may further or limit the individual choice to migrate.

The low passport ranking of case study countries in the passport index⁸³ (rankings are based on the number of destinations their holders can access), and a highly restrictive visa system, which has exorbitant costs, means that regular channels for cross border migration are extremely limited, leaving little mobility options for research participants. As research has shown, border controls have, in many cases, simply rerouted migrants

towards alternative, often more dangerous routes (De Genova, 2018; Squire, 2017). This was particularly apparent in the lives of people in Senegal and Guatemala who faced dangerous journeys to the Global North, across geographies that have become deathscapes as a result of unjust border controls. People in Cambodia were exposed to high visa costs and exploitation owing to their undocumented status when migrating illegally to Thailand. In Senegal, Guatemala and Cambodia remittances play a strong role in the country's economy, and this reduces the State's incentive to regulate migration. This leaves regular channels for migration less likely, and thus people engaging in cross-border migration face increased likelihood of exploitation and large costs in securing passage via irregular means. In this sense, mobility justice (Sheller, 2018) is one of the crucial political and ethical issues of our day. In Sheller's view, power and inequality inform the governance and control of movement, creating an overarching mobility (in)justice in the world.

Finally, debt bondage is a major problem in Cambodia, where the high costs to migrate interact with exorbitant interest rates charged by MFIs, trapping people in a cycle of debt. Often remittances are spent on repaying loans, instead of agricultural activities/ enhancements, often the reason for the migration of the family member in the first place. This was not the case in the other three countries.

Environmental migration is an increasingly salient and 'hot' topic, climate change mixed with the politicised discourse of migration which, in a Eurocentric dominant discourse, is often portrayed as a threat, calls for the need to challenge current narratives and discourses and to create and construct alternative ones. An increasingly challenging and urgent task in terms of human mobility, freedom of movement is now the main factor of social stratification: whilst some have freedom of movement, others remain trapped in place by the unjust border regime. Narratives and discourses help aliment myths and misconceptions of mi-

83. <https://www.passportindex.org/>

gration, such as that the biggest migration flow is the South-North migration (accompanied by terminology invoking ideas of out of control ‘floods’ or an invasion), whereas, as demonstrated by our four case studies and a vast body of research, **intra-regional migration is far more prevalent than inter-regional migration.**

Our research shows that there is an urgent need for other forms of knowledge about the climate-migration nexus that go beyond reductive depoliticized crisis narratives. We align with scholars who call for the need to challenge ‘othering’ and who have outlined how processes of othering are used in climate crisis narratives (Andreucci & Zografos, 2022) to invisibilize the historical responsibility of colonial States and capitalists in the Global North for generating the majority of greenhouse gas emissions and their responsibility for their impacts.

Joe Turner and Dan Bailey (2022) adopt the term **“ecobordering”**, to refer to how restrictions on immigration are seen as vital to protect the nativist stewardship of nature and where environmental destruction is portrayed as caused by people in the Global South, ignoring the far larger consumptive habits of wealthy nations.

In line with emerging case law trends, both individual States and the international community as a whole should deal with the effects of climate change upon individuals by assuming a **human rights-based approach** and also ensure a governance of migration that is responsible and respectful of the existing legal instruments of protection of human rights.

The manner in which the hostile environment is shaped is both a product of and response to society and nature. Thus, there is clearly a need for a more balanced and nuanced approach which recognises the intertwined nature of humans and the globe and inequalities in access to resources, including movement. In effect, **broadening the concept of climate justice to mobility justice** reveals how the climate crisis includes a broadened set of civil rights issues, with far-reaching implications beyond the environmental, directly understood. The right to work, to a healthy environment and to stay still, that is missing from the lives of our participants. As participants revealed, people wanted to stay, or go and return to Senegal, Cambodia and Guatemala. The lack of choice over remaining in Senegal/ Cambodia/ Guatemala was clear.

What is clear is that the right, as recognised by the UN Human Rights Council in October 2021, to a safe, clean, healthy, and sustainable environment is not being exercised by the inhabitants in the research sites. **This calls for urgent action.** The everyday lived experiences of research participants show how the climate crisis is exacerbated by the underlying socio-natural causes. We concur with Achille Mbembe (2020) who calls for the universal right to breathe, meaning not just biological breathing, but full enjoyment of the human experience. We see this as embedded in the right to a healthy environment for all in the widest sense. To adopt instead a politics of care, rooted in feminist and anti-racist praxis, to enable us ‘to render the world habitable for all, again’ (Mbembe and Goldberg, 2018).

RECOMMENDATIONS

These policy recommendations are developed in line with the aims and objectives of the #ClimateofChange project within the DEAR programme and thus directed towards the international community, the European Union and the national governments of EU Member States, as well as case study countries. Recommendations are based both on reflections on the global unequal ecological relations and the specific asks and solutions suggested by research participants who are seeking to make their own environments habitable again.

The international community should:

- Reinforce and utilise the pre-existing range of high-level commitments, policy instruments, stakeholder partnerships, and mechanisms that provide guidance on how to address internal and cross-border displacement related to the adverse effects of the climate crisis.
- Create new regular migration pathways which can provide relevant protection for migrants affected by the climate crisis and facilitate migration strategies in response (for example statuses could be provided for people who move in the context of climate change impacts, such as humanitarian visas, temporary protection, authorization to stay, regional and bilateral free movements' agreements, among others).
- Uphold the universal right to a safe, clean, healthy, and sustainable environment and enhance mobility rights (temporary visas or facilitated means to travel that overcome passport index, unjust border controls) and enforce recommendations made by the UN Special Rapporteur on human rights and the environment and the UN Special Rapporteur on Contemporary Forms of Racism, Racial Discrimination, Xenophobia and Related Intolerance.
- The UNEA (UN Environment Assembly) should kick-start negotiations toward a legally binding agreement on plastics (see <https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=28143&LangID=E>)
- Draw attention to and dismantle global unequal (ecological) relations through giving back the land to indigenous communities and reasserting the sovereignty of formerly colonised peoples, including access to and control over natural resources and other means of production and reproduction.
- Adopt new ecological thinking, which revisits and overturns colonialist understandings of the relationships between peoples, places, and their ecologies. Thinking which recognises the mutually affective connection between humans and nature, that is that we are inherently entangled with the lives of non-human creatures and the future of the planet we share.
- Enhance and share climate adaptation technologies.
- Call for the responsibility of States who have contributed the most to climate change to provide financial support to fund the mitigation and adaptation policies of MAPAs

National and/or local authorities of Senegal should:

- Revise the EU-Senegal Agreement on a sustainable fisheries partnership in the light of the adoption of the Post-Cotonou Agreement, as well as of the principle of sustainable development and the precautionary principle;
- Create protected marine zones to promote fish reproduction;
- Encourage plans for reforestation: planting mangroves, filao and other species which help fix the soil and protect against coastal erosion;
- Assist and enable activists on the ground to raise awareness on the climate crisis;
- Monitor waste that is sent to Senegal from other countries;
- Expand programmes reusing plastic bags to make hard paving stones, such as that developed at the Université Cheikh Anta Diop de Dakar (UCAD) University;
- Include local voices in decision making;
- Improve climate change knowledge and coping, mitigation and adaptation strategies.

National and/or local authorities of Cambodia should:

- Regulate forest clearance, to regulate and fine those who clear the flooded forest;
- Enhance water availability and irrigation schemes with additional technical support to improve cultivation and productivity;
- Promote and increase public awareness raising on the importance of flooded forests, and technical training on agricultural production;
- Reduce land grabbing and forced eviction;
- Improve protection for environmental activists;
- Include local voices in decision making;
- Improve climate change knowledge and coping, mitigation and adaptation strategies.

National and/or local authorities of Guatemala should:

- Better regulation on monoculture cultivation to avoid exploitative practises;
- Encourage environmental knowledge and improve community engagement in the protection of the environment;
- Implement adequate policies to promote an equal development;
- Implement and enforce laws on water, waste disposal and land usage;
- Improve protection for environmental activists;
- Improve climate change knowledge and coping, mitigation and adaptation strategies;
- Fight discrimination in access to land and violence against indigenous population.

National and/or local authorities of Kenya should:

- Develop and improve irrigation systems;
- Invest in alternative agricultural technology by also providing knowledge exchange with third countries to enhance good practise;
- Include local voices in decision making;
- Enhance security for pastoralists' movements;
- Cooperate with neighbouring countries for fully implementing the IGAD Protocol envisaging the development of safe and legal migration pathways at the regional level;
- Improve climate change knowledge and coping, mitigation and adaptation strategies.

The European Union and Member States should:

- Develop a robust political language defining the right to move, but also must defend the right to dwell, to remain and provide climate reparations to assist with this.
- Improve policy on media representations, moving away from othering and alarmist, depoliticised representations and narratives of resistance should be flagged rather than presenting people as (victims) purely succumbing to the unequal/ unhealthy status quo.
- Recognise diverse environmental knowledge - and seek to include different voices in climate activism/solutions and incorporate local people in decision making and climate solutions as well as enhance channels of communication and education/knowledge sharing.
- Cultivate solidarity alliances and collective action with people in the Most Affected People and Areas (MAPAs).
- Create regular migration pathways at the EU (temporary visas) and national level.
- Confront and overcome capitalist extractivism and climate colonialism. Thus to move away from fossil fuels to a more acute environmental awareness and responsible modes of production, and, importantly, to draw upon diverse epistemologies, away from Eurocen-

tric extractivist modes of production. It is the existing order that is the threat to long-term environmental security.

- Revise the EU-Senegal Agreement on a sustainable fisheries partnership in the light of the adoption of the Post-Cotonou Agreement, as well as of the principle of sustainable development and the precautionary principle
- Introduce mandatory measures to reduce plastic usage via ambitious targets, including scaling-up reuse and repair of equipment and products, which is proven to be more economically and technically effective than recycling and scale up Extended Producer Responsibility and corporate social responsibility as fundamental tools to tackle global plastic pollution

EU NGOs:

- Should create solidarity networks with those most directly affected to allow for the voices and opinions of those on the frontline of the climate crisis to be built into their strategies and agendas

BIBLIOGRAPHY

INTRODUCTION

Ajibade, I.J. and Siders, A.R. (2021) 'Introduction: Climate change and planned retreat', in Ajibade, I. J. and Siders, A. R., *Global Views on Climate Relocation and Social Justice*. 1st edn. London: Routledge, pp. 1–16. doi:10.4324/9781003141457-1.

Baldwin, A. (2013). Racialisation and the Figure of the Climate-Change Migrant. *Environment and Planning A: Economy and Space*, 45(6), 1474–1490. <https://doi.org/10.1068/a45388>.

Baldwin, A., & Bettini, G. (Eds.). (2017). *Life Adrift: Climate Change, Migration, Critique*. Rowman & Littlefield Publishers.

Bauman, Z. (1998). *Globalization: the human consequences*. New York: Columbia University Press.

Bettini, G. (2013). Climate Barbarians at the Gate? A critique of apocalyptic narratives on 'climate refugees'. *Geoforum*, 45, 63–72. <https://doi.org/10.1016/j.geoforum.2012.09.009>

Beyond Plastics (2021) *The New Coal: Plastics & Climate Change*. Vermont: Bennington College. Available at: <https://www.beyondplastics.org/plastics-and-climate> (Accessed: 22 October 2021).

Boas, I., Farbotko, C., Adams, H., Sterly, H., Bush, S., van der Geest, K., Wiegel, H., Ashraf, H., Baldwin, A., Bettini, G., Blondin, S., de Bruijn, M., Durand-Delacré, D., Fröhlich, C., Gioli, G., Guaita, L., Hut, E., Jarawura, F. X., Lamers, M., ... Hulme, M. (2019). Climate migration myths. *Nature Climate Change*, 9(12), 901–903. <https://doi.org/10.1038/s41558-019-0633-3>

Centre for Research on the Epidemiology of Disasters (CRED) (2018). *Cred Crunch 52 - Economic Losses, Poverty and Disasters: 1998-2017*.

Chakraborty I, Maity P. (2020). 'COVID-19 outbreak: Migration, effects on society, global environment and prevention', *The Science of the Total Environment*.

Durand-Delacré, D., Bettini, G., Nash, S. L., Sterly, H., Gioli, G., Hut, E., Boas, I., Farbotko, C., Sakdapolrak, P., de Bruijn, M., Tripathy Furlong, B., van der Geest, K., Lietaer, S., & Hulme, M. (2021). Climate Migration Is about People, Not Numbers. In S. Böhm & S. Sullivan (Eds.), *Negotiating Climate Change in Crisis* (pp. 63–82). Open Book Publishers. <https://doi.org/10.11647/obp.0265.06>

Flavell, A, Milan, A, and Melde, S. (2020), *Migration, environment and climate change: literature review*, First report in the "migration, environment and climate change" series, Ressortforschungsplan of the Federal Ministry of for the Environment, Nature Conservation and Nuclear Safety, Germany.

Geddes A, Adger WN, Arnell NW, Black R, Thomas DSG. *Migration, Environmental Change, and the 'Challenges of Governance.'* *Environment and Planning C: Government and Policy*. 2012;30(6):951-967. doi:10.1068/c3006ed.

Hirst, P. and Thompson, G. (1999) *Globalization in Question*. 2nd edition. Cambridge: Polity Press.

International Displacement and Monitoring Center. (2018). *Global Report on Internal Displacement*. <https://www.internal-displacement.org/global-report/grid2018/>

Ionesco, D., Mokhnacheva, D., Gemenne F. (2016). *The Atlas of Environmental Migration*, IOM.

IPCC (Intergovernmental Panel on Climate Change) (2014) *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B.

Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.). Cambridge, United Kingdom and New York, United States: Cambridge University Press, p. 1132. Available at: <https://www.ipcc.ch/report/ar5/wg2/> (Accessed: 24 January 2022).

IPCC (Intergovernmental Panel on Climate Change) (2018). An IPCC Special Report on the Impacts of Global Warming of 1.5°C above Pre-Industrial Levels and Related Global Greenhouse Gas Emissions Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty. United Nations. <https://www.ipcc.ch/sr15/>

IPCC (Intergovernmental Panel on Climate Change) (2021). Sixth Assessment Report, Climate Change 2021: The Physical Science Basis. <https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/>

Kälin W. (2018), The Global Compact on Migration: A Ray of Hope for Disaster-Displaced Persons, *International Journal of Refugee Law*, Volume 30, Issue 4, December 2018, Pages 664–667, <https://doi.org/10.1093/ijrl/eey047>

Kelman, I. (2020). 'Does climate change cause migration?', in Fiddian-Qasmiyeh, E. (ed.) *Refuge in a Moving World: Tracing refugee and migrant journeys across disciplines*. London: UCL Press, pp. 111–122.

Laczko F., Aghazarm C. (eds) (2009). *Migration, Environment and Climate Change: Assessing the Evidence*, Geneva: International Organization for Migration.

Lama P., Hamza M. & Wester M. (2021). Gendered dimensions of migration in relation to climate change, *Climate and Development*, 13:4, 326-336, DOI: 10.1080/17565529.2020.1772708

Lietaer, S., & Durand-Delacre, D. (2021). Situating 'migration as adaptation' discourse and appraising its relevance to Senegal's development sector. *Environmental Science & Policy*, 126, 11–21. <https://doi.org/10.1016/j.envsci.2021.09.008>

Mager, T. (2018). *The Emergency Trust Fund for Africa: Examining Methods and Motives in the EU's External Migration Agenda*. UNU Institute on Comparative Regional Integration Studies. <https://collections.unu.edu/view/UNU:7377#relatedLinks>

Mezzadra, S., Neilson B. (2013). *Border as method, or the Multiplication of Labor*, Durham-London: Duke University Press.

Miller, T., Buxton, N. and Akkerman, M. (2021). *Global Climate Wall: how the world's wealthiest nations prioritise borders over climate action*. Amsterdam: Transnational Institute. Available at: <https://www.tni.org/en/publication/global-climate-wall> (Accessed: 25 October 2021).

Musarò P. (2019). 'Aware Migrants: The role of information campaigns in the management of migration', in *European Journal of Communication*, 34(6), pp. 629–640.

Nshimbi, C.C. and Moyo, I. (2016). 'Visible and invisible bordering practices: The EU-African migration conundrum and spatial mobility of borders', *World Journal of Science, Technology and Sustainable Development*, 13(4), pp. 300–314. doi:10.1108/WJSTSD-01-2016-0014.

OHCHR (2019) *Global extractivism and racial equality. Special Rapporteur on contemporary forms of racism, racial discrimination, xenophobia and related intolerance*. A/HRC/41/54. UN Human Rights Council. Available at: <https://www.ohchr.org/en/issues/racism/srracism/pages/indexsrracism.aspx> (Accessed: 17 November 2020).

Pendergrass, D. and Vettese, T. (2020). 'The Climate Crisis and COVID-19 Are Inseparable', *Jacobin*, 31 May. Available at: <https://jacobinmag.com/2020/05/climate-change-crisis-covid-coronavirus-environment>.

- Raty, T., & Shilhav, R. (2020). The EU Trust Fund for Africa: Trapped between aid policy and migration politics. Oxfam. <https://doi.org/10.21201/2020.5532>
- Renou, Y. Diallo A. (2019). Changement climatique et migrations : qualification d'un problème, structuration d'un champ scientifique et activation de politiques publiques », *Mondes en développement* 2015/4, 172, pp. 87-107.
- Schipper, E.L.F., Dubash, N.K. & Mulugetta, Y. (2021). Climate change research and the search for solutions: rethinking interdisciplinarity. *Climatic Change* 168, 18. <https://doi.org/10.1007/s10584-021-03237-3>
- Sheller, M. (2018). *Mobility justice: The politics of movement in an age of extremes*, New York: Mimi Sheller.
- Sultana, F. (2021). Critical climate justice. *The Geographical Journal*, n/a(n/a). <https://doi.org/10.1111/geoj.12417>
- UN Human Rights Council (UNHRC (2019) Climate Change and Poverty: Report of the Special Rapporteur on Extreme Poverty and Human Rights. UN doc: A/HRC/41/39, 25 June. Available at: https://reliefweb.int/sites/reliefweb.int/files/resources/A_HRC_41_39.pdf.
- UNHCR and UNICEF (2014) Refworld | Safe and Sound: what States can do to ensure respect for the best interests of unaccompanied and separated children in Europe. Available at: <http://www.refworld.org/docid/5423da264.html> (Accessed: 5 January 2016).
- UNHRC (2019). Climate Change and Poverty: Report of the Special Rapporteur on Extreme Poverty and Human Rights. UN doc: A/HRC/41/39, 25 June. Available at: https://reliefweb.int/sites/reliefweb.int/files/resources/A_HRC_41_39.pdf.
- United Nations Environment Programme and International Livestock Research Institute (2020) *Preventing the Next Pandemic: Zoonotic diseases and how to break the chain of transmission*. Nairobi, Kenya. Available at: <https://www.unep.org/resources/report/preventing-future-zoonotic-disease-outbreaks-protecting-environment-animals-and>.
- von Lucke, F. (2021). 'Principled pragmatism in climate policy? The EU and changing practices of climate justice', *Political Geography*, 86, p. 102355. doi:10.1016/j.polgeo.2021.102355.
- World Bank Groundswell Report (2021), *Groundswell Part 2: Acting on Internal Climate Migration*. World Bank, Washington, DC. World Bank. <https://openknowledge.worldbank.org/handle/10986/36248>
- Zardo, F. (2020). The EU Trust Fund for Africa: Geopolitical Space Making through Migration Policy Instruments. *Geopolitics*, 0(0), 1–20. <https://doi.org/10.1080/14650045.2020.1815712>

SENEGAL

Agence Nationale de la Statistique et de la Démographie (ANSD) (2014), Rapport définitif, RGPHAE 2014. http://www.ansd.sn/index.php?option=com_rapports&view

Ajibade, I.J. and Siders, A.R. (2021) 'Introduction: Climate change and planned retreat', in Ajibade, I. J. and Siders, A. R., *Global Views on Climate Relocation and Social Justice*. 1st edn. London: Routledge, pp. 1–16. doi:10.4324/9781003141457-1.

Allison, E. H., Perry, A. L., Badjeck, M. C., Neil Adger, W., Brown, K., Conway, D., & Dulvy, N. K. (2009). Vulnerability of national economies to the impacts of climate change on fisheries. *Fish and Fisheries*, 10(2), 173–196.

Allison, E.H. et al.(2009) 'Vulnerability of national economies to the impacts of climate change on fisheries', *Fish and Fisheries*, 10(2), pp. 173–196. doi:10.1111/j.1467-2979.2008.00310.x.

Amara, R., Diop, M., Diop, C., & Ouddane, B. (2019). Chapter 37—The Senegalese Coastal and Marine Environment. In C. Sheppard (Ed.), *World Seas: An Environmental Evaluation (Second Edition)* (pp. 855–873). Academic Press. <https://doi.org/10.1016/B978-0-12-805068-2.00043-7>

Anthony, E.J. (2015). 'Patterns of Sand Spit Development and Their Management Implications on Deltaic, Drift-Aligned Coasts: The Cases of the Senegal and Volta River Delta Spits, West Africa', in Ranzazzo, G., Jackson, D.W.T., and Cooper, J.A.G. (eds) *Sand and Gravel Spits*. Cham: Springer International Publishing (Coastal Research Library), pp. 21–36. doi:10.1007/978-3-319-13716-2_2.

Ayet Puigarnau, J. (2019). Council Decision to authorise the Commission to open negotiations on behalf of the European Union for the conclusion of a protocol to the Sustainable Fisheries Partnership Agreement with the Republic of Senegal. <https://eurlex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52019PC0280&from=EN>

BBC News (2008). Senegal city is "most threatened", BBC News, 13 June 2008, news.bbc.co.uk/1/hi/world/africa/7452352.stm

BBC World Service Trust (2010). *Senegal Talks Climate. The public understanding of climate change*. Available at: <https://assets.publishing.service.gov.uk/media/57a08b09ed915d622c000a6f/07-Senegal-Talks-Climate.pdf>.

Belhabib D., Greer K. and Pauly D. (2017). Trends in Industrial and Artisanal Catch Per Effort in West African Fisheries

Belhabib, D., Le Billon P., and Wrathall D.J. (2020). "Narco-Fish: Global Fisheries and Drug Trafficking." *Fish and Fisheries*, June 26, 2020. <https://doi.org/10.1111/faf.12483>.

Belhabib, Dyhia, Viviane Koutob, Nassirou Gueye, Lamine Mbaye, Christopher Mathews, Vicky Lam, and Daniel Pauly (2013). "Lots of Boats and Fewer Fishes: A Preliminary Catch Reconstruction for Senegal, 1950–2010." *Fisheries Centre Working Papers*, 2013–03. University of British Columbia, 2013. <http://www.seaaroundus.org/working-papers/> .

Belhabib, Dyhia/ Sumaila, U. Rashid/Pauly, Daniel (2015): "Feeding the poor: Contribution of West African fisheries to employment and food security". In: *Ocean & Coastal Management*, 111, pp. 72-81.

Bernards, N. (2019). 'Latent' surplus populations and colonial histories of drought, groundnuts, and finance in Senegal. *Geoforum*. <https://doi.org/10.1016/j.geoforum.2019.10.007>

Bernards, N. (2020). Climate change: How Senegal's colonial history made it more vulnerable. *The Conversation*. <http://theconversation.com/climate-change-how-senegals-colonial-history-made-it-more-vulnerable-132063>

Blédé B., Diouf A., Compaoré P., (2015), Threats to Senegal's fishing sector: A case study from the Ziguinchor region.

Cirino, E. (2019) 'Plastic Pollution: Could We Have Solved the Problem Nearly 50 Years Ago? • The Revelator', *The Revelator*, 26 March. Available at: <https://therevelator.org/plastic-pollution-warnings/> (Accessed: 31 December 2021).

Cissé, O. (2012) *Les Decharges d'Ordures en Afrique, Mbeubeuss a Dakar au Senegal*. KARTHALA edition. Paris : Dakar: KARTHALA.

Daniels, A., Gutierrez, M., Fanjul, G., Guereña, A., Matheson, I., and Watkins, K. (2016). *Western Africa's Missing Fish. The Impacts of Unreported and Unregulated Fishing and Under-Reporting Catches by Foreign Fleets*. London: Overseas Development Institute.

Daniels, A., Gutiérrez, M., Fanjul, G., Guereña, A., Matheson, I., & Watkins, K. (2016). *Western Africa's missing fish. The impacts of illegal, unreported and unregulated fishing and under-reporting catches by foreign fleets*. Overseas Development Institute.porCausa Report. Available at: https://cdn.odi.org/media/documents/Western_Africas_missing_fish.pdf

Ehui, S. (2020) "'You only see trash. We see a treasure trove", why waste management in Senegal is a critical step toward sustainability', *WorldBank Blogs*. Available at: <https://blogs.worldbank.org/nasikiliza/you-only-see-trash-we-see-treasure-trove-why-waste-management-senegal-critical-step> (Accessed: 20 October 2021).

Einashé (2018 np) calls migration 'an act not only of survival but of imagination'.

Ellen MacArthur Foundation (2017). *Redesigning the future of fashion*. Available at: <https://ellen-macarthurfoundation.org/topics/fashion/overview>

Flothmann, S., Von Kistowski, K., Dolan, E., Lee, E., Meere, F. Album, G. (2010): "Closing Loopholes: Getting Illegal Fishing Under Control". In: *Science*, 328, 5983, pp. 1235-1236.

Fontana, A., Weber, J., (1982). *Aperçu de la situation de la pêche maritime sénégalaise (Dec-82)*. C.R.O.D.T., Dakar, 33 pp.

Food and Agriculture Organization (FAO) (2020): "The State of World Fisheries and Aquaculture 2020. Sustainability in action". At: <http://www.fao.org/publications/sofia/2020/en/>.

Geddes A, Adger WN, Arnell NW, Black R, Thomas DSG. Migration, Environmental Change, and the 'Challenges of Governance.' *Environment and Planning C: Government and Policy*. (2012). 30(6):951-967. doi:10.1068/c3006ed.

Giacomelli, E. & Walker, S. (2021, July 6). *Challenging Eurocentric Perceptions of Mobility Justice through Climate Diaries [Online]*. *The Sociological Review Magazine*. <https://doi.org/10.51428/tsr.gxit8834>

Greenpeace (2019): "Ghost Gear: The Abandoned Fishing Nets Haunting Our Oceans". At: <https://www.greenpeace.org/aotearoa/publication/ghost-gear-the-abandoned-fishing-nets-haunting-our-oceans/>.

Griffiths, M., Rogers, A. and Anderson, B. (2013) 'Migration, time and temporalities: review and prospect', COMPAS Research Resources Paper [Preprint]. Available at: http://www.academia.edu/download/31155326/Report_-_Migration_Time_and_Temporalities_FINAL.pdf (Accessed: 7 August 2017).

Gueye, C., Fall, A. S., & Tall, S. M. (2015). *Dakar, Touba and the Senegalese cities network produced by climate change*. *Current Opinion in Environmental Sustainability*, 13, 95–102. <https://doi.org/10.1016/j.cosust.2015.02.009>

- Gueye, C., Fall, A.S. and Tall, S.M. (2015) 'Dakar, Touba and the Senegalese cities network produced by climate change', *Current Opinion in Environmental Sustainability*, 13, pp. 95–102. doi:10.1016/j.cosust.2015.02.009.
- Hernández-Carretero, M., & Carling, J. (2012). Beyond 'Kamikaze Migrants': Risk Taking in West African Boat Migration to Europe. *Human Organization*, 71(4), 407–416.
- Hutson, A. (2021). In the Ocean: Senegal's Plastic Waste Problem. *Africa Today*, 68(1), 145–150.
- Ifekwunigwe, J. O. (2013). 'Voting with their feet': Senegalese youth, clandestine boat migration, and the gendered politics of protest. *African and Black Diaspora: An International Journal*, 6(2), 218–235. <https://doi.org/10.1080/17528631.2013.793139>
- IOM (2021) Rising Migrant Deaths Top 4,400 This Year: IOM Records More Than 45,000 Since 2014 | International Organization for Migration. Available at: <https://www.iom.int/news/rising-migrant-deaths-top-4400-year-iom-records-more-45000-2014> (Accessed: 20 January 2022).
- IOM/ACP Observatory on Migration (2012). https://publications.iom.int/system/files/pdf/case_of_senegal_en.pdf
- Jamieson, A.J. et al. (2019) 'Microplastics and synthetic particles ingested by deep-sea amphipods in six of the deepest marine ecosystems on Earth', *Royal Society Open Science*, 6(2), p. 180667. doi:10.1098/rsos.180667.
- Kaczynski, V. M., & Fluharty, D. L. (2002). European policies in West Africa: Who benefits from fisheries agreements? *Marine Policy*, 26(2), 75–93. [https://doi.org/10.1016/S0308-597X\(01\)00039-2](https://doi.org/10.1016/S0308-597X(01)00039-2)
- Koop, F., Aldred, J. (2020): "WTO fails to meet fishing subsidies deadline". At: <<https://chinadialogueocean.net/15886-wto-fails-to-meet-fishing-subsidies-deadline/>>.
- Koop, Fermin/Aldred, Jessica (2020): "WTO fails to meet fishing subsidies deadline". At: <<https://chinadialogueocean.net/15886-wto-fails-to-meet-fishing-subsidies-deadline/>>.
- Leenaars J.G.B., A.J.M. van Oostrum and M. Ruiperez Gonzalez, (2014). Africa Soil Profiles Database, Version 1.2. A compilation of georeferenced and standardised legacy soil profile data for Sub-Saharan Africa (with dataset). ISRIC Report 2014/01. Africa Soil Information Service (AfSIS) project and ISRIC - World Soil Information, Wageningen, the Netherlands. Available at: https://www.isric.org/sites/default/files/isric_report_2014_01.pdf
- Lewis, J. (2016). Cleaning Up Muddy Waters: The Fight to Revive Senegal's Hann Bay. *Environmental Health Perspectives*, 124(5), A92–A97. <https://doi.org/10.1289/ehp.124-A92>
- Liddick, D. (2014): "The dimensions of a transnational crime problem: the case of iuu fishing". In: *Trends in Organized Crime*, 17, pp. 290-312.
- Nelms, S.E. et al. (2020) 'Investigating the distribution and regional occurrence of anthropogenic litter in English marine protected areas using 25 years of citizen-science beach clean data', *Environmental Pollution*, 263, p. 114365. doi:10.1016/j.envpol.2020.114365.
- Ndour, A., Laïbi, R. A., Sadio, M., Degbe, C. G. E., Diaw, A. T., Oyédé, L. M., Anthony, E. J., Dussouillez, P., Sambou, H., & Dièye, E. hadji B. (2018). Management strategies for coastal erosion problems in west Africa: Analysis, issues, and constraints drawn from the examples of Senegal and Benin. *Ocean & Coastal Management*, 156, 92–106. <https://doi.org/10.1016/j.ocecoaman.2017.09.001>
- Okafor-Yarwood, I. and Belhabib, D. (2020) 'The duplicity of the European Union Common Fisheries Policy in third countries: Evidence from the Gulf of Guinea', *Ocean & Coastal Management*, 184, p. 104953. doi:10.1016/j.ocecoaman.2019.104953.

- Petrossian, G. A. (2015): "Preventing illegal, unreported and unregulated (IUU) fishing: A situational approach". In: *Biological conservation*, 189, pp. 39-48.
- Philippe, J. (2019). New SFPA protocol between EU and Senegal: artisanal fishing organisations call for a regional strategy. <https://www.cffacape.org/news-blog/2019/07/29/2019-7-29-new-sfpa-protocol-between-eu-and-senegal-artisanal-fishing-organizations-callfor-a-regional-strategy>
- Samson, M. (2015) 'Accumulation by dispossession and the informal economy – Struggles over knowledge, being and waste at a Soweto garbage dump', *Environment and Planning D: Society and Space*, 33(5), pp. 813–830. doi:10.1177/0263775815600058.
- Sanderman, J. et al. (2018) 'A global map of mangrove forest soil carbon at 30 m spatial resolution', *Environmental Research Letters*, 13(5), p. 055002. doi:10.1088/1748-9326/aabe1c.
- Sarr, F. (2018). *Afrotopia*, Roma, Edizioni dell'Asino.
- Sarr, F. (2019) *Afrotopia*. University of Minnesota Press. doi:10.5749/j.ctv105bb1g.
- Schöfberger I. (2018a). Environmental change and translocal vulnerability in Senegal, Policy Brief Series Vol. 4, Issue 3, at https://publications.iom.int/system/files/pdf/policy_brief_series_vol4_issue3.pdf.
- Sow, P., Marmer, E., & Scheffran, J. (2016). En route to Hell: Dreams of Adventure and Traumatic Experiences Among West African "Boat People" to Europe. In L. Mannik (Ed.), *Migration by Boat: Discourses of Trauma, Exclusion and Survival*. Berghahn Books.
- Sy, B. et al. (2020) 'Reconstituting past flood events: the contribution of citizen science', *Hydrology and Earth System Sciences*, 24(1), pp. 61–74. doi:10.5194/hess-24-61-2020
- Tessnow-von Wysocki I., Belhabib D., Le Billon P. (2021). *Undercurrents: Illegal fishing and European markets*. Available at: https://www.researchgate.net/publication/355159054_Undercurrents_Illegal_fishing_and_European_markets
- IPCC (Intergovernmental Panel on Climate Change) (2021). *Sixth Assessment Report, Climate Change 2021: The Physical Science Basis*. <https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/>
- Van Hear, N. (2017). Staying Power: Mobility, Mobilisation and Endurance in Times of Geopolitical Upheaval. *Geopolitics*, 0(0), 1–27. <https://doi.org/10.1080/14650045.2017.1327740>
- Viale, G. (2000). *Un mondo usa e getta. La civiltà dei rifiuti e i rifiuti della civiltà*. Feltrinelli Editore.
- Zickgraf, C. (2018). "The Fish Migrate And So Must We": The Relationship Between International And Internal Environmental Mobility In A Senegalese Fishing Community. *Medzinarodne Vzťahy (Journal of International Relations)*, 16(1), 5–21.

GUATEMALA

Alfaro Marroquín, G., & Gómez, R. (2019). Antecedentes y contexto del cambio climático en Guatemala. En E. J. Castellanos, A. Paiz-Estévez, J. Escribá, M. Rosales-Alconero, & A. Santizo (Eds.), Primer reporte de evaluación del conocimiento sobre cambio climático en Guatemala. (pp. 2–19). Guatemala: Editorial Universitaria UVG. Available at: <https://sgccc.org.gt/wp-content/uploads/2019/07/1RepC-CGuaCap1.pdf>

Alonso-Fradejas A. (2015). Anything but a story foretold: multiple politics of resistance to the agrarian extractivist project in Guatemala, *The Journal of Peasant Studies*, 42(3-4), 489-515, DOI: 10.1080/03066150.2015.1013468

Alpízar F., Saborío-Rodríguez M., Martínez-Rodríguez M. R., Viguera B., Vignola R., Capitán T. & Harvey C.A. (2020). Determinants of food insecurity among smallholder farmer households in Central America: recurrent versus extreme weather-driven events, *Regional Environmental Change*, 20:22. <https://doi.org/10.1007/s10113-020-01592-y>

Bake, M (2020). Remittances: A Key Factor for Economic Change and the Reduction of Poverty in Latin America – The Case of Guatemala.

Bardales Espinoza, W. A., Castañón, C., & Herrera Herrera, J. L. (2019). Clima de Guatemala, tendencias observadas e índices de cambio climático. En E. J. Castellanos, A. Paiz-Estévez, J. Escribá, M. Rosales-Alconero, & A. Santizo (Eds.), Primer reporte de evaluación del conocimiento sobre cambio climático en Guatemala. (pp. 20–39). Guatemala: Editorial Universitaria UVG.

Barnett, J., and W. N. Adger. (2007). Climate change, human security and violent conflict. *Political Geography* 26(6):639-655. <http://dx.doi.org/10.1016/j.polgeo.2007.03.003>

Benegas, L. (2006). Propuesta metodológica para evaluar la adaptación de los productores a la variabilidad climática, principalmente a la sequía en cuencas hidrográficas en América Central. Turrialba: Catie.

Bilsborrow, R., & DeLargy, P. (1990). Land Use, Migration, and Natural Resource Deterioration: The Experience of Guatemala and Sudan. *Population and Development Review*, 16, 125-147. doi:10.2307/2808067.

Brown, M. E., and C. C. Funk. (2008). Food security under climate change. *Science* 319(5863):580-581. <http://dx.doi.org/10.1126/science.1154102>

Canelas C. & Gisselquist R. M. (2018). Human capital, labour market outcomes, and horizontal inequality in Guatemala, *Oxford Development Studies*, 46(3), 378-397, DOI: 10.1080/13600818.2017.1388360

CCAD and SICA, (2011). Estrategia Regional de Cambio Climático. Available at: <http://www.cooperaitalia.org/Pobreza/Estrategia%20Regional%20Cambio%20Climatico.pdf>

Congressional Research Service (CRS) (2019). Guatemala: Political and Socioeconomic Conditions and U.S. Relations. Available at: <https://fas.org/sgp/crs/row/R42580.pdf>

Consejo Nacional de Cambio Climático (CNCC) (2017), Líneas de investigación en cambio climático. Consejo Nacional de Cambio Climático. Guatemala.

Consejo Nacional de Cambio Climático (CNCC). (2016), Plan de acción nacional de cambio climático. Guatemala.

Consejo Nacional de Desarrollo Urbano y Rural (CONADUR). (2014). Plan nacional de desarrollo K'atun: nuestra Guatemala 2032. Guatemala.

Eakin H., Tucker C.M., Castellanos E. (2015). Market Shocks and Climate Variability: The Coffee Crisis in Mexico, Guatemala, and Honduras. *Mountain Research and Development*, 25(4), 304-309.

Food and Agriculture Organization of the United Nations (FAO) (2020). FAO Migration Framework – Migration as a choice and an opportunity for rural development, Rome, CC BY-NC-SA 3.0 IGO.

Frost M. (United Nations Special Rapporteur on the situation of human rights defenders) (2016). They spoke truth to power and were murdered in cold blood - Analysis on the situation of environmental human rights defenders and concrete recommendations to better protect them. Available at: <https://www.frontlinedefenders.org/en/resource-publication/theyspoke-truth-power-and-were-murdered-cold-blood>

Fuentes Braeuner, G., Castellanos, E. J., & Juárez Calderón, M. A. (2019). Acciones de mitigación de gases de efecto invernadero. En E. J. Castellanos, A. Paiz-Estévez, J. Escribá, M. Rosales-Alconero, & A. Santizo (Eds.), Primer reporte de evaluación del conocimiento sobre cambio climático en Guatemala. (pp. 264–297). Guatemala: Editorial Universitaria UVG. Available at: <https://sgccc.org.gt/wp-content/uploads/2019/07/1RepCCGuaCap12.pdf>

Giacomelli, E. & Walker, S. (2021, July 6). Challenging Eurocentric Perceptions of Mobility Justice through Climate Diaries [Online]. The Sociological Review Magazine. <https://doi.org/10.51428/tsr.gxit8834>

Gleditsch N. P., Furlong K., Hegre H., Lacina B., and Owen T. . (2006). Conflicts over shared rivers: resource scarcity or fuzzy boundaries? *Political Geography* 25(4):361-382. <http://dx.doi.org/10.1016/j.polgeo.2006.02.004>

Green, L. (2009). The Fear of No Future: Guatemalan Migrants, Dispossession and Dislocation, *Anthropologica*, 51 (2), pp. 327-341.

Hale, C. (2006). *Mas Que Un Indio (More Than an Indian): Racial Ambivalence and the Paradox Of Neoliberal Multiculturalism in Guatemala*. Santa Fe: School for Advanced Research Press.

Hanjra, M. A., and M. E. Qureshi. (2010). Global water crisis and future food security in an era of climate change. *Food Policy* 35 (5):365-377. <http://dx.doi.org/10.1016/j.foodpol.2010.05.006>

Harmeling S, Eckstein D (2012) Global climate risk index 2013. Who suffers most from extreme weather events? Weather-related loss events in 2011 and 1092 to 2012. Germanwatch, Bonn

Hernández Bonilla and Morales Orellana (2020). Un éxodo que no se nombra. Aproximaciones al desplazamiento forzado interno por violencia en Guatemala (2010-2019). Available at: <https://www.pdh.org.gt/documentos/seccion-de-investigacion/investigacion/informes-tematicos/6266-resumen-ejecutivo-un-eixodo-que-no-se-nombra/file.html>

Hernández Castillo, R. Aída, and Andres Canessa, (eds.) (2012). *Género, complementariedades y exclusiones en Mesoamérica y los Andes*. Copenhagen: IWGIA.

Hernández Castillo, R. Aída. (2016). *Multiple Injustices: Indigenous Women Law and Political Struggle in Latin America*. Tucson: University of Arizona Press.

Hugo, G. (2011). 'Future Demographic Change and Its Interactions with Migration and Climate Change', *Global Environmental Change* 21, pp. S21–S33.

Human Rights Watch (HRW) (2020). *Deportation with a Layover. Failure of Protection under the US-Guatemala Asylum Cooperative Agreement*. Available at: *Deportation with a Layover Failure of Protection under the US-Guatemala Asylum Cooperative Agreement*; <https://reliefweb.int/report/united-states-america/us-government-s-new-safe-third-country-deal-guatemala-puts-asylum>.

Instituto Nacional de Estadística Guatemala (INE) (2018). *Portal de Resultados del Censo 2018*. Available at: https://censopoblacion.gt/archivos/resultados_censo2018.pdf

- Instituto Nacional de Estadística Guatemala (INE) (2019). Portal de Resultados del Censo 2019. Available at: <https://www.ine.gob.gt/ine/>
- Instituto Nacional de Sismología, Vulcanología, Meteorología e Hidrología de Guatemala (INSIVUMEH). (2015b). Análisis meteorológico del mes de enero 2015. Guatemala.
- Inter-American Commission for Human Rights (IACHR) (2017). Situation of Human Rights in Guatemala. Available at: <https://www.oas.org/en/iachr/reports/pdfs/Guatemala2017-en.pdf>
- Internal Displacement Monitoring Center (IDCM) (2018). Country Information: Guatemala. Available at: <https://www.internal-displacement.org/countries/guatemala>
- Lozano Sivilsaca D.C., Chacón-Cascante A., Montes G., & Robalino H.J. (2015). Eventos climáticos extremos y migración interna en Guatemala, un análisis basado en percepciones de expertos, *CIENCIA ergo-sum* 22(1), 35-44.
- Melville, T. & Melville, M (1971). *Guatemala: the politics of land ownership*. New York, Free Press.
- Milan A. & Ruano S. (2014). Rainfall variability, food insecurity and migration in Cabricán, Guatemala, *Climate and Development*, 6(1), 61-68, DOI: 10.1080/17565529.2013.857589
- Millard A. and Lara-Florian G. (2018). "Causes or Consequences? Reframing violence and displacement in Guatemala", Internal Displacement Monitoring Centre (IDMC).
- Ministerio de Ambiente y Recursos Naturales (MARN). (2009). Política nacional de cambio climático. Acuerdo Gubernativo 329-2009. Guatemala.
- Ministerio de Ambiente y Recursos Naturales (MARN). (2015). Segunda comunicación nacional sobre cambio climático Guatemala. Guatemala.
- Ministerio de Ambiente y Recursos Naturales (MARN) (2016). Acuerdo Ministerial 5-2016 (2016). Guatemala: Diario de Centroamérica.
- Moran-Taylor, M. J. (2009). Going North, coming South: Guatemalan migratory flows. *Migration Letters*, 6(2), 155-164. <https://doi.org/10.33182/ml.v6i2.74>
- Moran-Taylor, M., & Taylor, M. (2010). Land and leña: Linking transnational migration, natural resources, and the environment in Guatemala. *Population and Environment*, 32(2/3), 198-215.
- Pedersen, A. (2014). Landscapes of Resistance: Community Opposition to Canadian Mining Operations in Guatemala. *Journal of Latin American Geography*, 13(1), 187-214.
- Programa de las Naciones Unidas para el Desarrollo (PNUD) (2016). INFORME NACIONAL DE DESARROLLO HUMANO GUATEMALA. Available at: <http://desarrollohumano.org.gt/biblioteca/informes-nacionales/>
- Rosenbloom D., Markard J. (2020). A COVID-19 recovery for climate. *Science* 368 (6490) pp. 447. DOI: 10.1126/science.abc4887
- Sanchez, G., Achilli, L. (2020). Stranded : the impacts of COVID-19 on irregular migration and migrant smuggling, *Policy Briefs*, 20, Migration Policy Centre
- Scarnato, J. M. (2018). Deportation meets development: a case study of return migration in Guatemala, *Migration and Development*, 8:2, 192-206, DOI:10.1080/21632324.2018.1500004
- Schlosberg, D. (2004). Reconceiving Environmental Justice: Global Movements And Political Theories, *Environmental Politics*, 13(3), 517-540, doi:10.1080/0964401042000229025

Solano Garrido, A.L., Ochoa, W., (2019). Agricultura y seguridad alimentaria. In: Castellanos, E.J., Paiz-Estévez, A., Escribana, J., Rosales-Alconero, M., Santizo, A. (Eds.), Primer reporte de evaluación del conocimiento sobre cambio climático en Guatemala. Editorial Universitaria UVG., Guatemala, pp. 108–141.

Stephen, L. (2019). Fleeing rural violence: Mam women seeking gendered justice in Guatemala and the U.S., *The Journal of Peasant Studies*, 46:2, 229-257, DOI: 10.1080/03066150.2018.1534836

Taylor M.J, Aguilar-Støen, M., Castellanos E., Moran-Taylor, M.J. & Gerkin K. (2016). International migration, land use change and the environment in Ixcán, Guatemala. *Land Use Policy*, 54, 290-301.

Thorp R, Caumartin C, Gray-Molina G. (2006). Inequality, Ethnicity, Political Mobilisation and Political Violence in Latin America: The Cases of Bolivia, Guatemala and Perú, *Bulletin of Latin American Research*, Vol. 25, No. 4, pp. 453–480 <https://doi.org/10.1111/j.1470-9856.2006.00207.x>

UNHCR (2010). 'Report of the Special Rapporteur on the right to food, Olivier De Schutter. Addendum. Mission to Guatemala'

United Nations Human Rights Council (UNHRC) (2010). 'Report of the Special Rapporteur on the right to food, Olivier De Schutter. Addendum. Mission to Guatemala'

Van de Sandt, J. (2009). Mining Conflicts and Indigenous Peoples in Guatemala, Amsterdam University Law Faculty. Available at: https://www.cordaid.org/nl/wp-content/uploads/sites/2/2012/12/Mining_Conflicts_and_Indigenous_Peoples_in_Guatemala.pdf

Van Meerbeeck C.J. (2020). Climate Trends and Projections for the OECS Region. OECS Climate Change Adaptation Strategy & Action Plan - Technical Report Ref. 8 41 2412. Organisation of Eastern Caribbean States Commission. 80 pp. <https://www.oecs.org/climate-&-disasterresilience/resources.html?task=document.viewdoc&id=5> (accessed July 31, 2020).

Waddick (2017). Effects of Climate Change on Agriculture in Guatemala and Honduras. *Global Majority E-Journal*, Vol. 8, No.2 (December 2017). Pp. 109-120. Retrieved from: http://www.bangladeshstudies.org/files/Global_Majority_e_Journal_8_2_Waddick.pdf. Accessed on 13.11.2018.

World Bank (2017), Guatemala | data. Retrieved October 26, 2017, from <https://data.worldbank.org/country/guatemala>

World Meteorological Organisation (WMO) (2021). Annual report 2020. Time for a climate revolution. Available at: <https://www.globalwitness.org/en/about-us/global-witness-annual-reports/>

CAMBODIA

Amnesty International (2021). Cambodia's Prey Lang: how not to protect a vital forest. Available at: <https://www.amnesty.org/en/latest/news/2021/04/cambodias-prey-lang-how-not-to-protect-a-vital-forest/>

Asian Development Bank (2011). Facing the Challenge of Environmental Migration in Asia and the Pacific. Available at: <https://www.adb.org/sites/default/files/publication/29090/adb-brief-09-environmental-migration.pdf>

Brickell, K. et al. (2018) Blood Bricks: Untold Stories of Modern Slavery and Climate Change from Cambodia. Royal Holloway University of London. Available at: <https://static1.squarespace.com/static/596df9f8d1758e3b451e0fb2/t/5bc4d7cdc83025e41e7b10a0/1539627177544/Blood+bricks+high+res+v2.pdf> (Accessed: 7 October 2020).

Brickell, K. et al. (2020) 'Compounding crises of social reproduction: Microfinance, over-indebtedness and the COVID-19 pandemic', *World Development*, 136, p. 105087. doi:10.1016/j.worlddev.2020.105087.

Bylander, M. (2016). Cambodian Migration to Thailand: The Role of Environmental Shocks and Stress. KNOMAD Working Paper Series. Available at: <https://www.knomad.org/sites/default/files/2017-04/KNOMAD%20WorkingPaper%20CAMBODIAN%20MIGRATION%20TO%20THAILAND%20FinalJan19.pdf>

Chu, E., and K. Michael. (2019). Recognition in urban climate justice: Marginality and exclusion of migrants in Indian cities. *Environment and Urbanization* 31 (1):139–56. doi: 10.1177/0956247818814449.

Chua, S.D.X. et al. (2021) Drastic decline of floodpulse in the Cambodian floodplains (the Mekong River and the Tonle Sap system). preprint. *Rivers and Lakes/Instruments and observation techniques*. doi:10.5194/hess-2021-378.

Crang, P. et al. (2020) 'Discardscapes of fashion: commodity biography, patch geographies, and pre-consumer garment waste in Cambodia', *Social & Cultural Geography* [Preprint]. Available at: <https://www.tandfonline.com/doi/abs/10.1080/14649365.2020.1777322> (Accessed: 10 July 2020).

Derks, A. (2008). *Khmer Women on the Move: Exploring Work and Life in Urban Cambodia*. University of Hawai'i Press, Honolulu

Eyler, B. and Weatherby, C. (2019) *Letters from the Mekong: Toward a Sustainable Water-Energy-Food Future in Cambodia*. Washington DC: Stimson Center. Available at: <https://www.stimson.org/2019/letters-mekong-toward-sustainable-water-energy-food-future-cambodia-0/> (Accessed: 19 November 2021).

Giacomelli, E. & Walker, S. (2021, July 6). Challenging Eurocentric Perceptions of Mobility Justice through Climate Diaries [Online]. *The Sociological Review Magazine*. <https://doi.org/10.51428/tsr.gxit8834>

Green, K. (2018). Sustainable livelihood and poverty reduction. The Stung Treng Women's Development Center, Mekong Blue. Available at <http://mekongblue.com/2018/10/03/sustainable-livelihood-and-poverty-reduction/> .

Green, W.N. and Bylander, M. (2021) 'The Exclusionary Power of Microfinance Over-Indebtedness and Land Dispossession in Cambodia', *Sociology of Development*, 7(2), pp. 202–229. doi:10.1525/sod.2021.7.2.202.

Green, W.N. and Estes, J. (2019) 'Precarious Debt: Microfinance Subjects and Intergenerational Dependency in Cambodia', *Antipode*, 51(1), pp. 129–147. doi:10.1111/anti.12413.

ILO (2020) COVID-19 : Impact on Cambodian migrant workers. Phnom Penh: International Labour Organization Country Office for Thailand, Cambodia and Lao PDR, p. 22.

IOM (2019). Migration Impact on Cambodian Children and Families Left Behind. Available at: <https://www.louvaincooperation.org/sites/default/files/2020-08/Migration%20impacts%20on%20cambodian%20children-MHICCAF%20REPORT.pdf>

Jacobson, C. et al. (2019) 'When is migration a maladaptive response to climate change?', *Regional Environmental Change*, 19(1), pp. 101–112. doi:10.1007/s10113-018-1387-6.

Joshi, S. (2020). "Working Wives: Gender, Labour and Land Commercialization in Ratanakiri, Cambodia." *Globalizations* 17 (1): 1–15. doi:10.1080/14747731.2019.1586117.

Ministry of Labour and Vocational Training (MoLVT) (2010). Policy on Labour Migration for Cambodia 2010 – 2014. Government of Cambodia, Phnom Penh.

Morris, C. (2017) 'Justice Inverted. Law and Human Rights in Cambodia', in Brickell, K. and Springer, S. (eds) *The Handbook of Contemporary Cambodia*. Oxon: Routledge, pp. 29–41.

NASA Earth Observatory (2017). Cambodia's Forests Are Disappearing. Available at: <https://earthobservatory.nasa.gov/images/89413/cambodias-forests-are-disappearing>

Nurick, R. and S. Hak (2019). Migration and the involuntary return of undocumented migrants across the Cambodian-Thai border. *Journal of Ethnic and Migration Studies*.

Organisation for Economic Co-Operation and Development (OECD) (2017). Interrelations between Public Policies, Migration and Development in Cambodia. OECD Development Centre. Available at www.oecd-ilibrary.org/development/interrelations-between-public-policies-migration-and-development-in-cambodia_9789264273634-en (accessed 18 July 2019).

Pak, K. and Saing, S. (2019) *Vulnerability and Migration in Cambodia*. Phnom Penh: World Food Programme. Available at: <https://docs.wfp.org/api/documents/WFP-0000105976/download/>.

Pool, T. et al. (2019) 'Fish assemblage composition within the floodplain habitat mosaic of a tropical lake (Tonle Sap, Cambodia)', *Freshwater Biology*, 64(11), pp. 2026–2036. doi:10.1111/fwb.13391.

Sithirith, M. (2016) 'Political Economy of Fishing Villages: A Case Study in the Tonle Sap Lake, Cambodia', *Journal of Environmental Science and Engineering B*, 5(6). doi:10.17265/2162-5263/2016.06.005.

Sourn, T. et al. (2021) 'Evaluation of Land Use and Land Cover Change and Its Drivers in Battambang Province, Cambodia from 1998 to 2018', *Sustainability*, 13(20), p. 11170. doi:10.3390/su132011170.

Spires R.W. and Tost J. (2017). . "Rural Cambodian Women's Perspectives: An Exploratory Study on Community Ailments, Migration and Opportunity." *Asia Pacific Journal of Social and Behavioral Sciences*, 14, pp. 9-26.

Try, T. et al. (2015) SITUATION ANALYSIS AND NEEDS ASSESSMENT REPORT: ROHAL SOUNG VILLAGE A Selected Climate Smart Village, p. 71.

Tunon, M. and R. Khleang (2013). Cross-border labour migration in Cambodia: Considerations for the national employment policy. ILO-Asia Pacific Working Paper Series, ILO, Bangkok. Available at http://ilo.org/wcmsp5/groups/public/---asia/---robangkok/documents/publication/wcms_228484.pdf

UNDP (2019) Human Development Report 2019: Sustaining Natural Resources for All | UNDP in Cambodia. UNDP. Available at: https://www.kh.undp.org/content/cambodia/en/home/library/human_development/human-development-report-2019--sustaining-natural-resources-for-.html (Accessed: 2 October 2020).

USAID (2019) Climate Risk Profile: Cambodia. Washington DC. Available at: <https://www.climatelinks.org/resources/climate-risk-profile-cambodia> (Accessed: 12 October 2020).

Vigil Díaz-Telenti, S. (2019) Geopolitical Ecologies of Environmental Change, Land Grabbing and Migration: comparative perspectives from Senegal and Cambodia. Centre for Local Democracy. Available at: <https://repub.eur.nl/pub/120765> (Accessed: 30 September 2021).

von Braun J., Gatzweiler F.W. (2014) Marginality—An Overview and Implications for Policy. In: von Braun J., Gatzweiler F. (eds) Marginality. Springer, Dordrecht. https://doi.org/10.1007/978-94-007-7061-4_1

WFP (2019) Cambodia country strategic plan 2019-2023. Phnom Penh: World Food Programme. Available at: https://docs.wfp.org/api/documents/WFP-0000112436/download/?_ga=2.237338626.360041664.1602142466-513792381.1602142466 (Accessed: 8 October 2020).

World Bank (2020) World Bank Climate Change Knowledge Portal: Cambodia. Available at: <https://climateknowledgeportal.worldbank.org/> (Accessed: 12 October 2020).

KENYA

- Adow Mohamed (2008), Pastoralism in Kenya, conference on Climate Change and Forced Migration, Institute for Public Policy Research in London.
- Amwata D.A., Nyariki D.M., Musimba N.R.K., (2015), Factors influencing agro-pastoral and pastoral households' vulnerability to food insecurity in the dry lands of Kenya: A case study of Kajiado and Makueni Counties, *Journal of International Development*.
- Paul A. L., Kwonyike J. , Mulongo L., Kamar Imana D. (2022), Extractives Industries and Conflict: Reduction of Risks Associated with Extractive Industries in Turkana County, Kenya, *International Journal of Current Science Research and Review*, 5/2, 291.
- Castillejo C. (2016), The European Union Trust Fund for Africa: A Glimpse of the Future for EU Development Cooperation, *DIE Discussion Paper 22/2016*.
- Kahiga R.M., Kibui A.W., Nyaga G., Ngesu L.M., Mwaniki I.N., Mwaniki B. (2015), Health policies in Kenya and the new constitution for vision 2030, *International Journal of Scientific Research and Innovative Technology*, 2(1), 127.
- Kibugi R. (2015), Legal Options for Mainstreaming Climate Change Disaster Risk Reduction in Governance for Kenya, *Adaptation to Climate Change: ASEAN and Comparative Experiences*, 409.
- Kogo, B.K., Kumar, L., Koech, R (2021), Climate change and variability in Kenya: a review of impacts on agriculture and food security, *Environment, Development and Sustainability* 23, 23.
- Macharia, J. (2019), Sustainable Development in Kenya, *Horizons: Journal of International Relations and Sustainable Development* 13, 172.
- Maelo, F., Harris, G. (2021), Conflict Policing in the Pastoral Communities in Isiolo County, *Journal of Conflict Management*, 2(1), 13.
- Mallowah S., Oyier C. (2022), *The Environment and Climate Change Law Review: Kenya*.
- Nyariki, D.M. (2017), Assessment of the economic valuation of pastoralism in Kenya. A report for IGAD, Nairobi, Kenya.
- Nyariki, D.M., Amwata, D.A. (2019), The value of pastoralism in Kenya: Application of total economic value approach, *Pastoralism* 9, 9.
- Nyariki, D.M., and R.K. Ngugi. 2002. A review of African pastoral production system: Approaches to their understanding and development. *Journal of Human Ecology* 13 (3): 137–250.
- Rourke, J.M.A. (2011), Seasonal prediction of African rainfall with a focus on Kenya, Doctoral thesis, UCL (University College London).
- Schade, J. (2011), Human rights, climate change, and climate policies in Kenya: How climate variability and agrofuel expansion impact on the enjoyment of human rights in the Tana Delta, Bielefeld / Köln: Bielefeld University / FIAN Germany.
- European Commission (2020), *EUTF 2020 Annual Report*.
- IDMC (2015), A review of the normative framework in Kenya relating to the protection of IDPs In the context of the Kampala Convention and other supranational frameworks.
- IOM (2016), *Assessing the Evidence: Migration, Environment and Climate Change in Kenya*.
- Isiolo County Integrated Development (CIDP) Plan 2018-2022.

OHCHR (2012), Report of the Working Group on the Universal Periodic Review – Kenya.
Stockholm Environment Institute (2009), Project Report: Economics of Climate Change in Kenya.
The World Bank Group (2021), Climate Risk Profile: Kenya.
Truth, Justice, and Reconciliation Commission (TJRC), Report 2013.
UNDP (2018), Kenya Annual Report

CONCLUSIONS

Andreucci D., Zografos C. (2022). Between improvement and sacrifice: Othering and the (bio)political ecology of climate change, *Political Geography*, 92, 102512, ISSN 0962-6298, <https://doi.org/10.1016/j.polgeo.2021.102512>.

De Genova, N. (2018). The “migrant crisis” as racial crisis: Do Black Lives Matter in Europe? *Ethnic and Racial Studies*, 41(10), 1765–1782. <https://doi.org/10.1080/01419870.2017.1361543>

Mbembe, A. (2020, April 13). The Universal Right to Breathe. In the Moment. <https://critinq.wordpress.com/2020/04/13/the-universal-right-to-breathe/>

Mbembe, A., and Goldberg D.T: (2018). “The Reason of Unreason’: Achille Mbembe and David Theo Goldberg in conversation about Critique of Black Reason. *Theory, Culture & Society* 35, 7–8: 205–27. <https://doi.org/10.1177/0263276418800843>.

Parenti, C. (2011). *Tropic of chaos: Climate change and the new geography of violence*. Nation Books.

Sheller, M. (2018), *Mobility justice: The politics of movement in an age of extremes*, New York: Mimi Sheller.

Squire, V. (2017). Governing migration through death in Europe and the US: Identification, burial and the crisis of modern humanism. *European Journal of International Relations*, 23(3), 513–532. <https://doi.org/10.1177/1354066116668662>

Theory, Culture & Society 35, 7–8: 205–27. <https://doi.org/10.1177/0263276418800843>.

Turner J. and Bailey D. (2022) ‘Ecobordering’: casting immigration control as environmental protection, *Environmental Politics*, 31:1, 110-131, DOI: 10.1080/09644016.2021.1916197

APPENDIX I

REMOTE INTERVIEWS FROM JULY TO SEPTEMBER 2020

List of remote interviews with experts and stakeholders conducted via Zoom/Teams/Goole Meet between July and September 2020:

#	Country	Name	Position
1	Guatemala	Laura Hurtado	Guatemala Country Director for Action Aid
2	Senegal	Gemma	Associazione Casa Africa
3	ALL	Alfredo Agustoni	Università di Chieti
4	Senegal	Alassane Diallo	research teaching fellow, public University of Dakar, Amadou Mahtar M'Bow (Development Economics)
5	Guatemala	Mr. Diego Recalde	Representative from FAO-Guatemala
6	Senegal	Aicha Sarr	Associazione Stretto di Mano (senegalese-italian NGO)
7	Senegal	James Boyon; Aimè Bada	African Movement of Working Children and Youth (AMWCY)
8	Guatemala	Luis Rodríguez	Founder and Director of Guateambiente
9	Guatemala	Raúl Maas	director del Instituto de Ambiente y Recursos Naturales (IARNA) de la Universidad Rafael Landívar (URL)
10	Ethiopia	ANON (Male)	IDP EXPERT
11	Cambodia	Dr Sokhem Pech	Exec. Director - Cambodia Development Resource Institute
12	Ethiopia	Benjamin Larroquette	UNDP-GEF. Regional Technical Advisor Ethiopia
13	ALL	Ileana Sinziana Puscas	IOM- MECC (office in Geneva)
14	Guatemala	Sindy Hernández Bonilla	investigadora del subprograma Movilidad humana y dinámicas migratorias del Instituto de Investigación sobre Dinámicas Globales y Territoriales de la URL
15	Cambodia	Lee Siun	IOM-MECC Asia-Pacific
16	Cambodia	Anon (Male)	Climate Change expert
17	Cambodia	Tola Moeun (Mr)	Director of Central, Cambodia
18	Ethiopia	Anon (Female)	IGO
19	Ethiopia	Anja van Heelsum	Department of Political Science, University of Amsterdam

#	Country	Name	Position
20	Guatemala	David Wiersma	WeWorld- GVC
21	Guatemala	Pablo Escribano	Regional Thematic Specialist Migration, Environment and Climate Change (MECC) - IOM
22	Senegal	Giovanni Armando	LVIA NGO
23	Guatemala	Juan José Hurtado Paz y Paz	Director, Asociación Pop No'j
24	ALL	Robert McLeman	IPCC
25	Cambodia	Margherita Romanelli	WeWorld- GVC
26	Cambodia	Mr Sorn Sunsopheak	Deputy Director, Program Management Department, NCDD
27	Ethiopia	Anon (Male)	Head of climate resilience program, International NGO
28	Senegal	Makhfousse Sarr (Mr)	FAO- Senegal
29	Cambodia	Mr. Som Sopheak	Executive director of AFD - Action for development (climate change and resilience)
30	Ethiopia	Andrea Bessone	LVIA
31	Cambodia	Anon (male)	IGO
32	Senegal	Hélène Glenisson	Migration, Environment and Climate Change Consultant - IOM Senegal
33	Cambodia	Min Sophoan	ASVF

APPENDIX II

STRUCTURE OF FOCUS GROUPS

Using visual methods - 10 pictures of climate change and 10 pictures of migration shown to participants. Participants could also be asked to bring 10-20 pictures (or ideas) on climate change and migration from local media (newspapers; still media images):

- Use photos of images selected
- Main themes - collective perceptions that arise around interaction between climate change/migration + Climate Justice/Mobility Justice
- Any divergences? Why

FOCUS GROUP - divided in sections and interviews organised by section

QUESTIONS to derive from responses to visuals

Section 1 : climate change (Climate justice)

Participants shown 10 images of climate change

- Perceptions of changes in environment - what is environment for them
- Have you heard of the expression "climate change"?
- What is climate change/What do you understand about climate change?

- How does climate change affect your life/ how do you manage the impacts?
- What are the main causes of climate change/ environmental degradation?
- Who is responsible?
- What would improve your living conditions?

Section 2: migration (Mobility justice)

Participants shown 10 images of migration

- Is movement seen as positive/ desired, or is remaining preferred?
- What is migration/ who is a migrant for them? (positive/ negative/ aspiration/ necessity)
- What elements are understood as dis/enabling movement?

Section 3: Connecting climate change and migration

Open discussion on people's movement and relation to climate change

APPENDIX III

STRUCTURE OF SEMI-STRUCTURED INTERVIEWS

SOCIO-DEMOGRAPHIC

- nationality/ethnicity
- age
- gender
- civil status (if possible)
- level of education completed
- occupation/work

ISSUE 1. Perceptions of climate change & migration

- What is it
- How does it affect your life/ your family
- Structural factors (ease of movement/ responsibility for CC)

ISSUE 1A: Perception of migration/env. migration - Narratives and source of information:

- Could you tell me three words that describe your idea of migration?
- have you moved elsewhere yourself? if so,
- why?
- What was your movement influenced by? (PROMPTS):
 - by a family member, friend or acquaintance?
 - Were you in contact with someone who was already in (city of arrival)? Through which tool/network...? How often?
 - Where was the information coming from?
 - Did you use the internet, commercial websites, sms, social networks, private messaging services? What kind of networks (Facebook, Twitter, Reddit, WhatsApp, Telegram)? How intensively? In which way?
 - Did you get information about the (city of arrival) situation through the media in your village (TV, press, radio...)?
 - Did you receive information through any institutional source in your country of origin or in countries in transit? Any advertisement? Any TV show? Any campaign of information?

- Did you judge all the information as trustworthy? Who (person or channel) provided you the most valuable information?
- Could you tell us an idea/information about (city of arrival) that was always in your mind before going/coming?
- Has COVID affected those ideas/information channels?

ISSUE 1B. Perception of climate change

- Could you tell me three words that describe your idea of climate change?
- Do you think climate change is affecting your place of residence (village/country/geographical area)?
- Do you think climate change is affecting your life? How?
- How much of an impact do you feel these changes (access to food/water and changes in weather) have on your life at present?; Q: How much of an impact do you feel these changes (access to food/water and changes in weather) will have on your life in the future?
- In your opinion, overall, how have these changes (availability of water, food, electricity and fuel and changes in weather) affected your ability to... earn money to live/survive?
- Has the COVID pandemic affected you? how?
- What do you think are the main causes of climate change?
 - PROMPT: Do you think other countries are responsible for climate change/ environmental degradation? If so which countries/ why?
 - Do you think your state is responsible for climate change/ environmental degradation? If so why?

ISSUE 2. Coping strategies

- Individual level
- Household level
- village/Home area level
- State level

ISSUE 2A. For those to be interviewed in rural areas:

- Can you tell us of any changes in the environment in your area over the past (5) years?
- How has this impacted upon you/ your livelihood?
 - what would help you/ your village most deal with such impacts?
 - Are there any climate adaptation programmes? please elaborate
 - Prompt: do they work?
- Have you ever left your village? why/ why not?
 - Would you like to leave your village?
- Why? / why not?
 - prompt if yes: Are there obstacles to you leaving your village? What, if so?
 - where would you go? why?
- Consequences for people staying
 - What are the impacts of out-migration on your village?
 - Prompts: positive/ negative?
 - How do they feel about migration?

ISSUE 2B. For those to be interviewed in urban areas with migratory background:

- Movement (How; When; What; Why)
- ABOUT THE MIGRATION PROCESS (please adapt to source/transit/arrival/destination countries):
- Can you explain your journey here?

Prompts:

- How long ago?
- total duration/expected from the beginning of the migration process to the current destination whether or not he/she had family/friends supporting him/her in the place of destination before beginning the journey
- whether or not he/she had family/friends supporting him in transit before beginning the journey.

- Is the current destination your initial desired destination or not? Why?
- Did you find obstacles in leaving your village? if so, please explain
 - Prompts: did you require resources to leave? If so, what?
- Do you still support your family somewhere else? please elaborate
- Would you like to go back to the village? When?
- Would you move elsewhere?

Main reasons for migration

- How was your life like in your village?
- What did you do?
- What was a normal day like in your life?
- What was the main reason you decided to migrate?
- Could you point out any event, an event that was vital to make the decision to migrate? And any information that was relevant for it?
- When and how did you start planning everything? Did someone help you?
- If I give you this definition: "environmental migrant" 'persons or groups of persons who, predominantly for reasons of sudden or progressive change in the environment that adversely affects 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"
 - Would you say this could apply to those who have left?

Perception of migration

- If extreme weather were to happen in your local area, how prepared do you think you would be? please explain
 - If not prepared, would you consider to migrate? where?
 - If not prepared to migrate, what would you do in your local area?

ISSUE 3. Future aspirations - What dis/enables them

- How effective is your state in managing environmental degradation? could it do more? why/why not?
- Have you ever thought about going to another country? Which one? why?
- If yes, how would you access that country?
 - prompt: Have you got some information on the formal procedures to reach another country? Do you think that they facilitate the entry into another country?
 - How accessible are such procedures?
- Do you think that other countries should recognise special protection for those who can no longer make a livelihood due to climate change/environmental degradation?
- Do you think that other countries should recognise special protection for you?
- Do you think that other countries are responsible for/do not do enough to mitigate the situation of environmental degradation?
- Covid-19 - has the pandemic affected your mobility/ livelihood? If so, how?

APPENDIX IV

SURVEY QUESTIONNAIRE

Name of household head: _____ Gender: _____ Age: _____

[If different from HH head] Name of interviewee: _____ Gender: _____ Age: _____

Household number: _____

Household composition

1) Please provide information on your family members:

Family member	Gender	Age	Relation with household head	Current living situation (resident or temporary migrant)	Education (highest level completed)

2) What language do your household members or most of them speak? _____

A. Migration pattern of the household

3) Was your father born in [REGION] ? Yes/No

4) Were you born in [REGION]? Yes/No

- If No:

4.1 In which year did you move to [REGION]? _____

4.2 Why did you move to [REGION]?
 To find a job in agriculture
 To find a job not in agriculture
 To looking for land for cultivation
 Other

4.3 Did your family move with you? Yes/No

- If No:
After how long did they join you?
 Within 6 months
 Between 6 months – 1 Year
 After more than 1 Year

- If Yes:
Did you always live in the same place in [REGION]? _____

5) Do you live elsewhere some time of the year for work reasons? Yes/No

- If yes, where do you go?

5.1 How long (months)?

- Up to 1 month
- 1-3 months
- 4-6 months
- 6-12 months

5.2 What type of work do you do at place of destination?

- Farm work
- Factory work
- Construction work
- Domestic and/or care work
- Skilled employment (e.g. electrician)
- Business
- Professional employment (e.g. teacher, manager)
- Other (Please state)

5.3 Does your family go with you?

- Yes
- No

6) Does another member of your family live else where some time of the year for work reasons? Yes/No

- If Yes, Who? _____

6.1 Where?

6.2 How long (months)?

- Up to 1 month
- 1-3 months
- 4-6 months
- 6-12 months

6.3 What type of work does s/he do at place of destination?

- Farm work
- Factory work
- Construction work
- Domestic and/or care work
- Skilled employment (e.g. electrician)
- Business
- Professional employment (e.g. teacher, manager)
- Other (Please state)

6.4 Does your family go with him/her, including you?

7) Have any member of your family migrated permanently for labour in the last 10 years?

N°	Year of migration	Education level at migration	Destination	Age at migration	Gender	Type of activity the individual was engaged in before migration (please select*)	Type of work the individual does at place of migration (please select**)	Share of the income covered by money sent by migrant to family in last year (approx.)	Did the family need to send any money to the migrant? If so how much (in %) compared to the household income?

*Options for type of activity before migration: 1. School/college; 2. Farm labour; 3. Income generating activity outside the hh; 4. Reproductive work for the hh

**Options for type of work: 1. Farm work; 2. Factory work; 3. Construction work; 4. Domestic work; 5. Skilled employment (e.g. electrician); 6. Business; 7. Professional employment (e.g. teacher, manager); 8. retired with pension; 9. Other (Please specify)

8) Do you plan to move in the near future from the place where you currently live?

- Yes - questions 8.1, 8.2, 8.3
- No
- I would like to but I cannot - question 8.3 and 8.4
- Don't Know

8.1 When do you plan to move?

- Within a year
- Between one and two years
- More than two years
- Don't Know

8.2 Where?

- in the capital,
- in another urban area,
- in another rural area
- abroad
- Don't know

8.3 Why would you like to move?

Contextual factors:

- Lack of affordable and/or sufficient quality food (1 to 10, where 1= totally disagree 10=totally agree)
- Lack of affordable and/or adequate educational opportunities (1 to 10, where 1= totally disagree 10=totally agree)
- Lack of affordable and/or adequate health-care services (1 to 10, where 1= totally disagree 10=totally agree)
- Lack of job opportunities other from agriculture (1 to 10, where 1= totally disagree 10=totally agree)
- Lack of initiatives supporting agricultural and rural activities, e.g. credit and investment opportunities, public programmes supporting agriculture, etc. (1 to 10, where 1= totally disagree 10=totally agree)
- Success stories from other migrants (1 to 10, where 1= totally disagree 10=totally agree)

- Lack of opportunities to achieve personal aspirations (1 to 10, where 1= totally disagree 10=totally agree)
- Other, please specify (1 to 10, where 1= totally disagree 10=totally agree)

Individual factors:

- The possibility to provide my family with resources for higher quality education (1 to 10, where 1= totally disagree 10=totally agree)
- The possibility to provide my family with resources for more adequate healthcare (1 to 10, where 1= totally disagree 10=totally agree)
- The possibility to save money for future economic investments in agriculture (1 to 10, where 1= totally disagree 10=totally agree)
- The possibility to save money for future economic investments in sectors other from agriculture, e.g. real estate (1 to 10, where 1= totally disagree 10=totally agree)
- The possibility to count on friends and relatives' support in the receiving country (1 to 10, where 1= totally disagree 10=totally agree)
- The possibility to re-join with a family member who migrated (1 to 10, where 1= totally disagree 10=totally agree)
- The possibility to make an experience for personal/skill development(1 to 10, where 1= totally disagree 10=totally agree)
- Other, please specify (1 to 10, where 1= totally disagree 10=totally agree)

Agricultural activities in which you are involved:

- Abandoning the agricultural activities would be the main reason to migrate (1 to 10, where 1= totally disagree 10=totally agree)
- I would not be happy to leave agriculture, but I would prefer to leave the country anyway (1 to 10, where 1= totally disagree 10=totally agree)
- Agricultural activities would not impact my decision either to migrate or not to migrate (1 to 10, where 1= totally disagree 10=totally agree)
- Cultivating land would be one of the factors that would prevent me to migrate (1 to 10, where 1= totally disagree 10=totally agree)

8.4 Why do you feel you cannot?

[List reasons for being stuck]

- Too dangerous (1 to 10, where 1= totally disagree 10=totally agree)
- Too expensive (1 to 10, where 1= totally disagree 10=totally agree)
- Don't want to leave my family (1 to 10, where 1= totally disagree 10=totally agree)
- Lack of legal documents (1 to 10, where 1= totally disagree 10=totally agree)

Livelihoods of the household

9) List the main livelihood activity for each household member (*Note for the interviewer: please be consistent with the household numbering provided at question 1*)

Activities that individuals are engaged in? Numbers of hours per day (approx.)											
N°	Income generating activity				Agricultural work on own farm			Reproductive work			
	Going to school or college	Farm work (others land)	Off farm labour	Other income generating activity	Farm labour	Animal husbandry	Hunting	Cooking	Collecting fuelwood and forest products as berries or mushrooms	Childcare/elderly care	Housekeeping other than cooking (e.g. cleaning, laundry, tidying rooms, vacuuming, etc.)

If more than 1 income generating activity: Among those listed above, which income generating activity is the most important for your household? _____

10) What other income sources do your household have?

Income source	Approximate share of the overall annual household budget
<input type="checkbox"/> Business other than agriculture	
<input type="checkbox"/> Salaries other than agriculture	
<input type="checkbox"/> Sale of agricultural and/or livestock	
<input type="checkbox"/> Subsidies/Social benefits	
<input type="checkbox"/> Pension	
<input type="checkbox"/>	

B. Vulnerability of the Household (Water, Energy, Food security, Climate Change)

11) Does your Household have

- A television
- A radio
- A Bicycle
- A motorbike/three-wheel motorbike
- A fan
- An air conditioner
- ...

12) What is the main source of drinking water for members of your household?

- Piped water
- borehole
- Water from spring
- Rainwater
- Tanker truck
- Cart with small tank
- Surface water (e.g. river, dam, ..)
- Bottled water
- Other

13) What is the main source of water used by your household for other purposes such as cooking and handwashing?

- Piped water
- Borehole
- Water from spring
- Rainwater
- Tanker truck
- Cart with small tank
- Surface water (e.g. river, dam, ..)
- Bottled water
- Other

14) In the last year, has there been any time when your household did not have sufficient quantities of drinking water when needed?

- 14.1 Yes/No
- 14.2 If yes: When?_____

15) What type of fuel or energy source is used for the cooking?

- Traditional fossil fuels (*E.g. Alcohol, Gasoline, Kerosene, Charcoal*)
- Wood and/or by-products (*e.g. pellets, woodchips, sawdust*)
- Straw/Shrubs/Grass
- Agricultural waste
- Animal manure
- Other

16) What type of fuel or energy source is used to heat the household when needed?

- Traditional fossil fuels (*E.g. Alcohol, Gasoline, Kerosene, Charcoal*)
- Wood and/or by-products (*e.g. pellets, woodchips, sawdust*)
- Straw/Shrubs/Grass
- Agricultural waste
- Animal manure
- Other

17) At night, what does your household mainly use to light the home?

- Electricity
Rechargeable flashlights/Torch/lantern
- Appliances based on fossil fuels (*E.g. Gasoline/Oil lamp*)
- Wood and/or by-products (*e.g. pellets, woodchips, sawdust*)
- Straw/Shrubs/Grass
- Agricultural waste
- Animal manure
- Candle
- No lighting in the household
- Other

18) In the last 5 years, did your household experience a climate-related crisis? Yes/No

- If yes: which one: Storms/Floods/Droughts/Hot waves/
- If yes: did your household receive assistance?
- If yes, from whom? Government agencies/NGOs/Politicians/Religious organizations/Local community group/Friends, relatives, neighbours

19) Do you think your household is exposed to the following extreme events?

Storms (1 to 10, where 1= not likely 10=almost certain)

Floods (1 to 10, where 1= not likely 10=almost certain)

Droughts (1 to 10, where 1= not likely 10=almost certain)

Hot waves (1 to 10, where 1= not likely 10=almost certain)

- If >5pt ask if the risk has increased/decreased/same in the past 5 years

20) In the past year, were you or any adult household member not able to eat the kinds and/or the amount of foods you preferred/needed because of a lack of resources?

- If yes, how often did this happen? (1=less than 1 month, 2=between 1-3 months, 3= Between 3-6 months, 3=Between 6 to 8 months, 5=all year)
- If not 5: In which months particularly? (Jan-March; Apr-Jun; Jul-Sep; Oct-Dec)

20a) In the past year, did you or any adult household member have to eat smaller portions and/or to eat fewer meals in a day because there was not enough food? Yes/No

- If yes, how often did this happen? (1=less than 1 month, 2=between 1-3 months, 3= Between 3-6 months, 3=Between 6 to 8 months, 5=all year)
- If not 5: In which months particularly? (Jan-March; Apr-Jun; Jul-Sep; Oct-Dec)

20b) In the past year, did you or any adult household member have to eat a limited typology of foods due to external circumstances (e.g. lower production in the field, raising economic constraints) ? Yes/No

- If yes, What type of food was not available?
 - Meat/fish
 - Fresh fruit/vegetables
 - Rice/corn/potatoes
 - Beans and legumes
 - Dairy (milk, eggs)
 - Sweet products
 - Other
- If one or more selected: With what other type of foods did you substitute them?
 - Meat/fish
 - Fresh fruit/vegetables
 - Rice/corn/potatoes
 - Beans and legumes
 - Dairy (milk, eggs)
 - Sweet products
 - I did not substitute them
 - Other
- If yes, how often did this happen (1=less than 1 month, 2=between 1-3 months, 3= Between 3-6 months, 3=Between 6 to 8 months, 5=all year)
- If not 5: In which months particularly? (Jan-March; Apr-Jun; Jul-Sep; Oct-Dec)
 - If any of 20/20a/20b is YES

21) In the past year, did you or any adult household member experience weight loss due to changes in the dietary regime? Yes/No

22) Considering now with respect to the past 12 month, due to changes in the dietary regime, your general health status is 1=severely worsened; 2=worsened; 3=didn't change; 4=improved; 5=significantly improved

23) During the year, do you depend on your own farm as a source for food? Yes/No

- If yes, how often does this happen (1=less than 1 month, 2=between 1-3 months, 3= Between 3-6 months, 3=Between 6 to 8 months, 5=all year)
- If not 5: In which months particularly? (Jan-March; Apr-Jun; Jul-Sep; Oct-Dec)
 - If yes, Is it increased/decreased/ same in the past 5 years?

24) What type of food products do you buy at the market to integrate what you produce in your farm for home consumption?

- Meat/fish
- Fresh fruit/vegetables
- Rice/corn/potatoes
- Beans and legumes
- Dairy (milk, eggs)
- Sweet products
- I don't buy any food product at the market
- Other

- If diff from I DON'T BUY, how often does this happen (1=less than 1 month, 2=between 1-3 months, 3= Between 3-6 months, 3=Between 6 to 8 months, 5=all year)
- If not 5: In which months particularly? (Jan-March; Apr-Jun; Jul-Sep; Oct-Dec)
 - If yes, Is it increased/ decreased/same in the past 5 years?

25) In the last 5 years, did your household receive funds from one or more public programs?

Yes/No

- If yes, from which program(s)?_____

C. Agriculture and Fishery

26) Are you primarily engaged in agriculture or fishery?

- Agriculture - Go to section E.1

E.1 Agriculture: land possession and use of land

27) What types of agricultural activities do your households conduct?

- Cultivation of land
- Livestock
- Other

28) At the moment do you or any member of the household have, use or rent land plot(s)?
[list from the most to the less important for the household livelihood]

Plot	Land use	Possession	Dimension	Irrigation type

Land use: Crops/Paddock/Orchard/Land at rest/ Forest reserve/Pastureland

Possession: owned/rented in/rented out/ cooperative/ borrowed..

Irrigation type: groundwater/canal/rain/other

- if Land use = CROPS

Plot	Type of crop	Use (for sell, for consume, for both)	Average yield (t)	Use of pesticide (Chemical, Non chemical, No pesticide)

Type of crops: Corn; Beans; Rice; Squash; Tubers; Vegetables; Fruit trees/fruit; Other

29) Is what you produce on your plot enough or not enough to support your family?

- Yes
- No
- Don't know

30) Do you think that here in your village there is enough land for your children to stay?

- Yes
- No
- Don't know

31) Would you like more families to come to live here in your village?

- Yes
- No

32) What agricultural asset do you own?

	Number	Income in last year (from renting, meat or live sales)
Livestock		
Livestock		
Livestock		
Livestock		
Livestock		
Livestock		

	Owned	Rented in	Rented out	Yearly maintenance cost (including fuel)	Yearly rental cost	Yearly rental revenues
Equipment						
Equipment						
Equipment						
Equipment						
Equipment						
Equipment						

33) Do you transform agricultural products before selling them? Yes/No

34) What is your role?

- Owner engaged in the activities on-shore
- Owner engaged in fishing
- Skipper
- Fisherman

35) What is the effort?

- Number of fishing trips per day?
- Average duration of a fishing trip?
- Average working hours on-shore? (*daily avg on 24h basis*)

36) What is the destination of the first sale of the products?

- Wholesaler
- Export
- Processing industry
- Direct selling (*final costumer/ restaurants*)
- Self-consumption

37) What kind of energy is used for the boat?

- Paddles
- Wind
- Fuel
-

38) Do you transform agricultural products before selling them? Yes/No

D. Environmental change: F.1 for agriculture

F.1 if q11 "Agriculture"

39) How have cropping patterns changed over the last 10 years?

Crops cultivated more	Reason: 1. Highly profitable 2. Growing market/ demand 3. Requires less labour 4. Falling productivity 5. Other	Crops cultivated less	Reason: 1. No longer profitable 2. Less demand 3. Requires too much labour 4. Falling productivity 5. Other

40) Farmers face various problems with nature and agricultural production. What problem have you had with your crops **last year**?

- Soil quality is poor
- Pests
- Animals that destroy crops
- Weed invasion
- Lack of rain
- Floods
- Other
- I had no problem

41) Have you ever faced one or more of the following problems regarding your plot?

- Land succession
- Expropriation
- Land tenure in general
- Conflicts with neighbours over water use
- Conflicts with neighbours over borders (land is not taxed but family owned)Subsides disputes

42) Tell us about any land transactions in your household over last 20 years

Land acquired	How? (1=bought; 2=gifted/ inherited from family;	If it was bought, whom was it bought	Land lost	How? (1=sold; 2=gave to family member; 3=leased)	If it was sold, whom was it sold to?

43) How have fishery patterns changed over the last 10 years?

Species fished more	Reason: 1. Highly profitable 2. Growing market/ demand 3. Requires less labour 4. Falling productivity 5. Other	Species fished less	Reason: 1. No longer profitable 2. Less demand 3. Requires too much labour 4. Falling productivity 5. Other

44) Fishers face various problems with nature and fishery. What problem have you had with your activity last year?

- Bad weather
- Lack of fish
- Algae invasion
- Other
- I had no problem

45) Have you ever faced one or more of the following problems regarding your plot?

- Boat succession
- Boat tenure in general
- Licence acquisition and/or maintenance
- Disputes over fishing quotas
- Conflicts with neighbours over fishing quotas
- Tax disputes
- Subsidies disputes

46) Tell us about any transactions regarding your activity over last 20 years

Boat/ equipment/ fishing license acquired	How? (1=bought; 2=gifted/ inherited from family; 3=leased; 4=acquired from government)	If it was bought, who was it bought from?	Boat/ equipment/ fishing license lost	How? (1=sold; 2=gave to family member; 3=leased out; 4=taken by government)	If it was sold who was it sold to?

E. Financing migration and remittances

47) Think of the current migrants from your household. How did they finance the migration process? (select all which are relevant)

- Loan Savings
- Money from relatives
- Money saved from earlier migration
- Other

48) Think of the current migrants from your household. If a loan was taken to facilitate his/her migration, how much has been borrowed in total _____
... and what was the interest rate(s):

49) From whom were the loans taken from?

- Local money lender
- Bank
- Relative or friend
- Other (please specify)

50) How the loan is being repaid?

- Remittance
- Local wage labour
- Another loan
- Selling of agricultural produce
- Selling of assets e.g. land
- Other _____

51) With the current migrants in your household, have any of their employers contributed to the costs of migration? Yes/No

52) If you think of the money you have actually received from migrant family members over the last year, in which categories the remittance are invested?

- Children's education (*mention level also*)
- Healthcare
- Food items
- Clothes
- House construction/renovation
- Agricultural inputs
- Agricultural service e.g. harvester
- Other agricultural expenses (*e.g. renting equipment/tractor*)
- Loan repayment
- Family and life events/ marriages, etc.
- Savings for future
- Other

53) Over the last 5 years, have you used the money received from migrant family members to buy any of the following assets? If yes, how many?

Item	Quantity
Livestock	
Heavy agricultural machinery/equipment	
Light agricultural machinery/equipment	
Irrigation system	
Land	
New House	
Paid for the wedding or funerals	
Expensive medical treatment (surgery, for example)	
Other high value asset	

54) Who in the household collects the remittance?

- Mainly the wife/husband of a migrant
- Mainly the father of a migrant
- Mainly the mother of a migrant
- Grandparents of a migrant
- Sons/daughters over 18 years old
- Other (specify) _____

55) How are they transferred? (tick all that apply)

- Bank
- Brought by migrant in cash
- Through online system/mobile app
- Through minivan drivers
- Other

56) Who in the family decides how to use remittance money?

- Mainly the wife/husband of a migrant
- Mainly the father of a migrant
- Mainly the mother of a migrant
- Mainly parents of a migrant together
- Grandparents of a migrant
- Together all adults in a household
- Sons/daughters over 18 years old
- Other (specify) _____

57) Think of the current migrants from your household, please specify changes associated with their migration:

Type of change	Level of change
The amount of land cultivated by our household	1 to 10, where 1= greatly decreased, 10=greatly increased
The amount of livestock	1 to 10, where 1= greatly decreased, 10=greatly increased
The quality and amount of the infrastructure in the community, e.g. tanks, irrigation canals	1 to 10: 1= greatly improved, 10=greatly worsened, 0 Not applicable
The education that children/grandchildren are receiving	1 to 10: 1= greatly improved, 10=greatly worsened, 0 Not applicable
The innovative technologies in agricultural activities	1 to 10: 1= greatly improved, 10=greatly worsened, 0 Not applicable
The living conditions	1 to 10: 1= greatly improved, 10=greatly worsened, 0 Not applicable
The access to health care	1 to 10: 1= greatly improved, 10=greatly worsened, 0 Not applicable
The ability to pay loan	1 to 10: 1= greatly improved, 10=greatly worsened, 0 Not applicable
Workload of family members who stay behind (describe for each member)	1 to 10: 1= greatly improved, 10=greatly worsened, 0 Not applicable
The tendency for other family members to migrate	1 to 10: 1= greatly improved, 10=greatly worsened, 0 Not applicable
Household investment in enterprises	1 to 10: 1= greatly improved, 10=greatly worsened, 0 Not applicable
Household engagement in local wage labour	1 to 10: 1= greatly improved, 10=greatly worsened, 0 Not applicable
Relationship of the household with community	1 to 10: 1= greatly improved, 10=greatly worsened, 0 Not applicable
Relationship of the household members with other relatives outside the household	1 to 10: 1= greatly improved, 10=greatly worsened, 0 Not applicable
Any other comment on the impact of migration?_____	

F. The impact of Covid-19 on livelihood of rural households

58) Please indicate your degree of accordance with the following sentences
[1: completely disagree; 10 completely agree
– 0 Not applicable]

- During the restriction measures caused by covid-19, I was able to work on my land plot
- During the restriction measures caused by covid-19 I was able to go fishing
- During the restriction measures caused by covid-19 I was able to go to work
- During the restriction measures caused by covid-19, I was able to reach the farmer market to sell my products
- During the restriction measures caused by covid-19, I was able to reach the farmer market to buy grocery
- During the restriction measures caused by covid-19, my household had difficulties in getting enough affordable quality food

59) During the restriction measures caused by covid-19, the financial support my household had to provide to a migrant member has

- Increased
- Decreased
- Remained the same
- There was not any migrant household member in need of financial support

60) During the restriction measures caused by covid-19, the amount of remittances received by my household has

- Increased
- Decreased
- Remained the same
- My household did not receive remittances also before quarantine

61) During the restriction measures caused by covid-19, the income level of my household has

- Increased
- Decreased
- Remained the same
- Don't know/don't answer

Cover | Chim Arn, 59, and his grandson watch the storm from their village in Puok District (Siem Reap) ©RounRy

Back cover | Maria Candelaria Carillo Tomás and her son from Huehuetenango village ©SergioLópez-SenderMérida

The project “End Climate Change, Start Climate of Change” is co-funded by the European Commission in the framework of the DEAR programme (Development Education and Awareness Raising) and aims to develop young EU citizens awareness and critical understanding of climate change induced migration, as one of the biggest challenges of the globalized world.

Our main goal is to build a better future both for climate induced migrants and for young people who will face the worst effects of the climate crisis. Through the engagement of youth in the #ClimateOfChange campaign we will highlight the interdependencies of local and global inequality to empower them not only to change their everyday lives, but also to become advocates on global justice issues.

PARTNERS





www.climateofchange.info

