



Ministry of Environment



# ASSESSMENT REPORT

LINKAGES BETWEEN CLIMATE CHANGE AND  
MIGRATION IN SRI LANKA



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# **Assessment Report**

## **Linkages Between Climate Change and Migration in Sri Lanka**







# ACKNOWLEDGEMENT

This assessment report is the output of an in-depth study on linkages between climate change and migration in Sri Lanka conducted jointly by the Ministry of Environment (MoE) and the International Organization of Migration (IOM). This study was conducted as part of the project titled “Understanding Migration, Environmental Degradation, and Climate Change in Sri Lanka”, supported by the IOM Development Fund. The MoE and IOM are grateful to Institute for Policy Studies (IPS) Sri Lanka for undertaking this research on their behalf.

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# FOREWORD

A small littoral state in the Indian Ocean, Sri Lanka is ranked among the countries that are most vulnerable to climate change-induced disasters. The country has continued to rank among the top ten countries at risk of extreme weather events by the Global Climate Risk Index published by the German Watch. I am pleased that the Ministry of Environment as the national focal point for the United Nations Framework Convention on Climate Change (UNFCCC), together with all stakeholder organizations makes every effort to ensure protecting, conserving, and sustainably using our natural environment, to combat the climate crisis and move towards climate sustainability through various national and local level programmes and international climate commitments.

Climate change adversely impacts the balance of natural ecosystems and negatively impacts all sectors: agriculture, fisheries, livestock, energy, transport, industry, waste, water, and forestry identified in Nationally Determined Contributions (NDCs) of Sri Lanka. Addressing climate change through mitigating Green House Gas (GHG) emissions, implementing multisectoral and integrated adaptation measures, and paying attention to loss and damage in all sectors are priorities of Sri Lanka's path to sustainable development. On the other hand, there is an urgent need to pay attention to other dimensions of climate change such as the nexus between climate change and human mobility.

There is an abundance of evidence worldwide demonstrating that climate change is one of the drivers of human mobility. Hence it is a timely need to investigate Sri Lankan context as well. At present, the national-level data and information are inadequate to, acknowledge and recognize climate-induced human migration, prioritise urgent actions to develop lasting solutions, and base human migration dimensions within our climate change policies and programmes. The project implemented by the International Organization for Migration (IOM) in collaboration with the Climate Change Secretariat of the Ministry of Environment and all other relevant stakeholders is an important initiative to assist the national efforts in development.

I express my sincere gratitude to the Climate Change Secretariat and IOM for taking this initiative and extend my gratitude to collaborators who engaged and contributed to compiling this assessment report on linkages between climate change and migration based on the research carried out by Institute for Policy Studies (IPS). I reaffirm the Ministry's commitment to work together with IOM in future endeavors for the achievement of Sri Lanka's climate sustainability agenda.

Dr Anil Jasinghe  
Secretary  
Ministry of Environment, Sri Lanka



# FOREWARD

'The climate crisis' is reshaping our world, impacting modern civilization from multiple fronts. The global data depicts that the loss of vital ecosystems and their services due to the changing climate conditions are forcing the mobility of local communities within and outside the national boundaries. These movements associated with physical, social, economic, and environmental vulnerabilities challenge the marginal communities with food, water, and economic security.

The world today is witnessing an era of unprecedented human mobility, with more than one billion people on the move. Whilst well-managed migration has been recognized as an enabler of socio-economic development, forced migration due to poverty, conflict, climate change, and disasters can lead to deterioration in development outcomes. Environment disasters, the adverse effects of climate change, and environmental degradation are increasingly driving migration and displacement everywhere.

Human mobility in response to climate impacts may range from mobility as a proactive adaptation strategy to forced displacement in the face of life-threatening risks.

Recognizing the necessity to step up national, regional, and international efforts to address human mobility challenges associated with environmental factors and climate change, IOM continues to work with its member States and relevant partners to prevent and minimize forced migration that results from environmental factors. It further assists and protects affected populations, facilitates migration in the context of climate change adaptation, and enhances the resilience of affected communities.

As the leading United Nations agency for migration, IOM Sri Lanka continues to stand with the Government and people of Sri Lanka to ensure safe and orderly migration. The project "Understanding the linkages between migration, environmental degradation, and climate change in Sri Lanka" was implemented in partnership with the Ministry of Environment. I am hopeful that this study will assist the Ministry of Environment and its partners in evidence-based decisions and integrate human mobility dimensions in policies and programmes related to climate change.

I would like to record my sincere appreciation and gratitude to the Ministry of Environment for their leadership and continued support throughout the implementation of this project.

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Sarat Dash  
Chief Of Mission for Sri Lanka and Maldives  
International Organization for Migration





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## ABBREVIATIONS

A/L	Advanced Level
ADB	Asian Development Bank
ADRC	Asian Disaster Reduction Center
CBSL	Central Bank of Sri Lanka
CSO	Civil Society Organizations
DMC	Disaster Management Centre
DMCU	District Disaster Management Coordinating Units
DSD	Divisional Secretarial Division
FAO	Food & Agriculture Organization
FGD	Focus Group Discussion
GN	Grama Niladari
HH	Household
HHH	Household Head
IDMC	Internal Displacement Monitoring Centre
IOM	International Organization for Migration
IPCC	Intergovernmental Panel on Climate Change
KII	Key Informant Interview
LKR	Sri Lankan Rupee
Max	Maximum
Min	Minimum
MOH	Ministry of Health
N/A	Not Available OR Not Applicable
NDC	Nationally Determined Contributions
NDRSC	National Disaster Relief Service Centre
NGO	Non-Governmental Organizations
No:	Number
O/L	Ordinary Level
Obs	Observations
SLRCS	Sri Lanka Red Cross Society
Std.	Standard
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WASH	Water Sanitation and Hygiene
WFP	World Food Programme

# EXECUTIVE SUMMARY

Human mobility is both an adaptation strategy and a coping mechanism in response to climate-related hazards. Depending on the type and the severity of the hazard, the resultant mobility can be a displacement or a migration which could be temporary, seasonal, or permanent. This study focuses on the nexus between climate change as translated via natural hazards such as floods, landslides, droughts and sea level rise-related issues and human mobility, aiming to identify discerning areas for policy intervention concerning the four phases of a climate disaster risk management: resilience building, preparedness, response and recovery. This report presents the data and the discussion in six chapters: Chapter 1 acts as an introduction to the report, while Chapter 2 underlines the conceptual and analytical framework, data, methodology of analysis and limitations of the study. It is followed by Chapter 3, which presents an extensive analysis of the sample by mobility status, mobility type and differences between various groups. Chapter 4 deals with the discussion of vulnerable groups: children, youth, females, female-headed HHs, the elderly and differently abled individuals, followed by chapter 5 focusing on the slow onset and extreme climate events and related mobility. Chapter 6, the concluding chapter, presents a synthesis of findings, suggestions for future research and policy recommendations.

The study was carried out using quantitative and qualitative data collected from HHs from 15 districts exposed to the four climate hazards in concern. Quantitative data were collected from a sample of 1501 HHs involving 5724 individuals, while qualitative data were collected via 30 KIs; 3 FGDs and 6 case studies. In the sample, while all respondent HHs were exposed to at least one of the climate disasters listed above, it includes HHs with and without exposure to mobility.

The analysis of the communities faced with climate events, their experiences with mobility and mobility patterns finds that the proportion of males among the mobile persons is higher than females. In contrast, the proportion of left behind males is less than that of females due to male sorting in planned mobility. Similarly, mobile populations have a relatively higher share of employed persons. Moreover, a greater concentration is evident of those in the prime working age among mobile persons. There is no difference in average individual monthly income among those who moved and did not move. However, in favour of the former, a difference can be observed in the average HH monthly income between HHs with and without mobile persons. The study finds that the ownership of agricultural land is closely linked with HHs not having a migrant from the HH. Furthermore, the findings indicate that mobility is associated with greater livelihood options. The deep dive analysis of vulnerable groups shows that for children, youth, women and differently abled persons, mobility is more likely to occur with the rest of the HH due to rapid onset events. Thus, they are less likely to experience temporary or seasonal migration. Among youth, there is a clear majority of males. The share of employed youth is higher among migrant youth than among non - mobile youth, while the average monthly income of migrant youth is higher than that of non - mobile youth. In three out of the four categories of vulnerability: children, youth, the elderly and differently abled individuals, most of those who have experienced mobility were men.

Displacement, which has a clear correlation with sudden onset climate events, shows near equal shares of women and men. Qualitative data reveal that those experiencing displacement have a preferred order in terms of the type of shelter to displace to, starting from known HHs to community level buildings. Modern technology, such as social media or early warning alarm systems, is helpful in rapidly alerting a large group of people. When the type of support provider is considered, the majority of individuals had received support from the government. However, qualitative data reveal that accessibility to support is unequal and indicate instances of corruption in the distribution of relief and support measures. For temporary and seasonal migration, HHs are more likely to select the most suitable family member for migration mostly based on their earning potential. Both types of migrations are highly correlated with areas prone to sea level rise and drought. The economic push factors identified in the study include unreliable harvest/lack of food security in the origin. Similar to displacement, permanent migration or relocation reflects a clear correlation with exposure to rapid onset climate events and the sample includes cases of migrants who were forced to migrate as well as ones who migrated willingly.

Regarding the variation in migration across different vulnerable groups and the coping strategies adopted by vulnerable groups among the left behinds, The study finds that among adults there are equal proportions of men and women, with a larger proportion of women among non-mobile individuals and a smaller proportion among migrants. This gender difference can be explained through patriarchal social and gender norms that support men as the breadwinner, while women are more associated with childcare and HH responsibilities at home. Similarly, the gender wage gap in

Sri Lanka is likely to serve as another reason. The likelihood of women staying behind as a result of sea level rise and drought is higher compared to the other forms of climatic events studied. Regarding variation in mobility across youth and adults, the study finds that the most common type of mobility for both groups was displacement. For differently abled persons, the most common types of mobility recorded are displacement and permanent migration. The findings confirm that displacement and permanent migration do not allow a selection process but necessitate all HH members, including those who are differently abled to move. At the same time, temporary and seasonal migration shows that there are a few differently abled persons among migrants. Furthermore, the study shows that the number of female headed HHs that faced displacement and permanent migration is larger than those exposed to temporary or seasonal migration.

Among those left behind, the most popular coping mechanisms include selling and pawning HH assets, borrowing money (microfinance institutions or relatives) and using previous savings. However, the qualitative data collection reflects rich nuances of coping mechanisms adopted by the vulnerable groups in concern. The analysis reveals that the absence of coping mechanisms related to social safety nets, especially for sea level rise and drought, adversely affects children's education through HH income, ultimately resulting in students dropping out of school. Despite their distress, the study finds no evidence of psychological support for children during climate disasters. One key aspect of women's coping strategies is in terms of income earning and livelihood, which includes left behind women working collaboratively with the community towards the continuation of livelihoods, borrowing money to be repaid with remittances, reliance on the government social safety net and foregoing medical attention to prioritize same for other HH members. Drawing on the synergies of older and younger women, maintaining social ties and in general, performing a dual gender role too are some of the noticeable coping mechanisms of females left behind. With regards to the elderly, the key coping strategies include harnessing the support of the community, relying on payments provided by the government and continuation of their livelihoods. The findings also show that the elderly are often challenged when accessing displacement centers during climate events, as well as accessing medication and treatment while displaced.

The analysis of seasonal and temporary migration with a focus on drought and issues related to sea level rise shows that declining yields, neglect of tanks and lack of water are push factors for migration from drought affected areas. Other push factors include health problems linked to the lack of water, financial issues and the human-elephant conflict. On the flip side, improved employment opportunities in cities, well-established social networks and proximity to destinations act as pull factors. Sea level rise, results in damages to crops and equipment and impairs farmers and fishermen's ability to pay back loans or replace equipment. Apart from these, sea erosion causes damages to fishermen's boats and coastal flooding damages farmers' houses and belongings, paddy fields and harvested stocks, while water contamination adversely affects their health. Left-behind women in these HHs are compelled to assume the role of HHH and take on additional parental and gendered duties while the children endure safety issues, addictions, disruption to education and health issues. The mobile persons, too, go through issues at the destination related to food, accommodation, safety and health. However, for fishermen, their employer provides essentials such as food and shelter at their destinations.

The six overarching recommendations highlight the importance of resilience building through improvements to coping strategies and the ability to isolate climate change from other push factors for migration within affected populations. The objective is that the adaptation and coping strategies are incorporated into their aligning sector policies through necessary policy and programme frameworks. A Roadmap to advocate and guide the integration of human mobility dimensions in sectoral policies and programmes will enable the policymakers and the other stakeholders to approach these interventions holistically. The roadmap will take a cross-section of priorities from the national level to the community level as informed by the ground-level data. The research findings essentially show that the interventions for resilience building are context specific. Thus, the road map will serve as a key tool for decision-making institutions for targeted development interventions. Further, recommendations focus on knowledge building regarding safe migration behaviours and proper management of remittances via information and experience-sharing sessions at the community levels in affected areas as well as areas receiving migrant communities. There is greater scope and need for community-level awareness and capacity building enabling people to take informed decisions. The recommendations also encompass the importance of network building and the existence of support communities to enhance the psychological and social well-being of affected communities and strengthen the existing nodes and networks through a bottom-up approach to build the resilience of affected populations.

# 1. INTRODUCTION

The nexus between climate change and human mobility is complex. This complexity stems from many aspects. Climate factors are only one of the many drivers of human mobility, while the interlink of these multiple drivers amplifies the complexity. At the same time, different climatic impacts lead to various forms of mobility, while existing risks may affect mobility outcomes. Moreover, human mobility – including displacement,<sup>1</sup> temporary migration, permanent migration and relocation, is often considered a strategy of last resort in the face of climate disasters. Among climate disasters, rapid onset events present the clearest examples of human mobility linked to climate and environmental factors. For example, across the Asia Pacific region, over 225 million people were internally displaced by sudden onset events between 2010 and 2021, the highest of any region globally (IDMC, 2022). By contrast, the impact of slow onset events on mobility is often indirect, observable only with a time lag and therefore inherently more difficult to identify and quantify.

Being an island, Sri Lanka experiences varied detrimental impacts of climate change, including slow onset climate- disasters such as sea level rise,<sup>2</sup> extreme weather conditions such as droughts as well as rapid onset climate events such as floods and landslides. Internal migration is considered one of the main socio-economic outcomes of the increased frequency and severity of climate disasters in Sri Lanka (Climate Change Secretariat, Sri Lanka, 2016). Data from the Household & Income Expenditure Survey reveals that, in 2016, one in every 11 HHs was affected by disasters in Sri Lanka. In 2016, HHs were mainly affected by heavy rain and related floods, wild animal attacks and extended dry periods without rainfall. Similarly, landslides, heavy winds, as well as changed monsoon patterns, wind speed and directions have caused most of the climate and environment-related human mobility in Sri Lanka (IOM, WFP, FAO, 2018).

The overall objective of this study is to produce an assessment report based on in-depth research on the nexus between climate change and human mobility in Sri Lanka, by focusing on the four climate impacts and four types of human mobility. The climate impacts focused on are floods, landslides, drought and sea level rise, while the types of human mobility considered are displacement, temporary migration, seasonal migration and permanent migration. This study considers climate change as a “change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to other natural climate variabilities that have been observed over comparable time periods” (International Organization for Migration (IOM), 2014, p. 19). The four climatic hazards focused on here are selected to represent climate vulnerable populations in Sri Lanka that resort to four mobility patterns considered here. In the analysis, the word “human mobility” is used when migration and displacement are considered together. In other contexts, “migration” refers to either temporary, seasonal, or permanent migration.

“Vulnerability” is a concept that relates to risk. In the context of climate change, the 3<sup>rd</sup> Intergovernmental Panel on Climate Change (IPCC) Report defines vulnerability as the extent to which a natural or social system is susceptible to sustaining damage from climate change (IPCC, 2001). This report further identifies “vulnerability is a function of the character, magnitude and rate of climate change and variation to which a system is exposed, its sensitivity and its adaptive capacity” (IPCC, 2001, p. 21). In other words, resilience is the opposite of vulnerability. In the climate change context, it is less vulnerable to climate change issues and more capable of adapting and thereby resisting and recovering from damage (SOPAC, n.d.). The concept of vulnerability is ingrained throughout this research in terms of natural and social systems. The vulnerability of natural systems is the underlying principle for selecting climate impacts. The four climate impacts aptly represent the three climatic zones in Sri Lanka and the various agro-ecological regions and the related vulnerabilities that trigger the mobility of the population. For instance, rapid onset events such as flash floods and landslides are associated with loss and damage to housing and related infrastructure, destabilising individuals’ basic need for shelter and in turn, triggering displacement. Extreme weather events such as droughts are associated with negative implications on livelihoods, for example, damage to crops and livestock and destruction of assets necessitating temporary migration in search of employment or livelihood opportunities to support HH incomes. Some individuals combine temporary migration with the seasonality of climate-affected livelihood opportunities in their area of origin and destination to become seasonal migrants. Similarly, some climate impacts render certain areas unsafe for human settlements and necessitate some to relocate permanently, while other climate impacts alter conditions in the areas

<sup>1</sup> Displacement may include evacuation. Permanent displacement, which is another type of displacement identified by DMC is considered under permanent migration/relocation.

<sup>2</sup> In this report the phrase sea level rise is used to reflect a continuum of climate implications including sea level rise, sea water intrusion, salinity and coastal erosion.



of origin to an extent where opportunities in areas of destination are made more appealing to encourage permanent migration.

Expanding beyond climate change-related vulnerability, this study also deals with the concept of economic vulnerability. As noted by Noy and Yonson (2018), “in Economics, the concept of vulnerability is typically applied to four areas of interest, other than disasters: poverty, food security, asset-vulnerability and sustainable development”. Climate and disaster-related damages, losses and implications on populations and physical assets result from the interaction between economic vulnerability and climate change events (Noy & Yonson, 2018). Similarly, the vulnerability of social systems is related to livelihood vulnerability, which is composed of external risks, shocks, stress and internal aspects related to the lack of means to cope without incurring losses (Alwang, Siegel, & Jorgensen, 2001). For example, the agriculture and fisheries sectors are highly dependent on natural resources and thus traditionally associated with vulnerability and poverty in Sri Lanka (World Bank Group, 2020).

The concept of vulnerability in climate change-induced human mobility is multifaceted and complex. Vulnerable populations have the fewest opportunities to adapt locally or to move away from risk and when moving, often do so as a last resort. When made vulnerable to climate change and not resilient to remain in their place of residence, some change their residential and work locations to adapt and rebalance their economic and livelihood vulnerability. The IPCC (2001) notes that the ability to adapt is a function of wealth, technology, information, infrastructure, institutions, equity, empowerment and the ability to spread risk. As such, the climate disaster-related resilience building, preparedness, response and recovery are affected by population mobility, which in turn can alter many of the above factors in one’s determinants of the ability to adapt or change residential or work locations when faced with climate events. Nevertheless, some, who are even more vulnerable, will be unable to move and thus remain trapped in increasingly unviable areas (IPCC, 2018). As noted by IPCC (2021), climate change risks result from the dynamic interactions between climate-related hazards with the exposure and vulnerability of the affected human system to hazards.

In this context, authors identify vulnerability and human mobility as having a complex and bi-directional relationship, where vulnerability leads to migration. In contrast, the inability to move can lead to further vulnerability. As established in the literature, migration is positively associated with wealth and social capital, while vulnerability to environmental change is negatively correlated with wealth and social capital (Foresight, 2011). Hence, those with lower wealth or capital face the twin risks of future environmental change due to their inability to move away from situations of increasing climate change risks and the increased climate change risk due to their lack of capital. Such populations are likely to become trapped in the very places where they have become vulnerable to climate change.

As such, human mobility is often considered an adaptation strategy when disasters occur because it helps build resilience to adverse effects of climate shocks by providing new opportunities and resources to affected people. It is also employed as a coping strategy when other solutions have failed (Mbaye, 2017) (Advisory Group on Climate Change and Human Mobility, 2015). In the context of this study, human mobility is considered a continuum, where forced displacement and voluntary migration are at the two extremes and where the combination of choice and coercion result in various types/categories/classifications of migrants in between (Hugo G. , 2010; Yamamoto, Serraglio, & Cavedon-Capdeville., 2018). Hence, this study uses the phrase “human mobility” to refer to all types of movements, regardless of forced or voluntary, unless otherwise differentiated and those who have experienced such movement as “mobile persons”. Along with these types of mobile persons, this study mainly focuses on human mobility within Sri Lanka- where an internal migrant is a person who has left the HH (or HHs that migrated altogether) to live in a different residence within the country.

Among the four types of mobility considered in this study, displacement is defined as the sudden removal of a person from his or her home due to a climate event,<sup>3</sup> while temporary migration is a short trip to a destination and subsequent return to the area of origin. Seasonal migration (a type of temporary migration) is defined as the periodic movement of a person from one region to another in accordance with the cycle of weather/temperature changes or agricultural practices to combine activity at several places according to seasonal labour requirements.<sup>4</sup> Permanent migration is defined as relocating<sup>5</sup> with no intention to return.

<sup>3</sup> The definition adopted here is crafted based on IOM (2014). Displacement considered in this study also includes planned evacuation in response to imminent climate disaster to avoid sudden displacement.

<sup>4</sup> The definition adopted here is crafted from GEMET (2021) and Keshri and Bhagat (2012).

<sup>5</sup> Relocation as defined in IOM (2014) has an emphasis on re-building livelihoods in another place.

## 2. RESEARCH METHODOLOGY

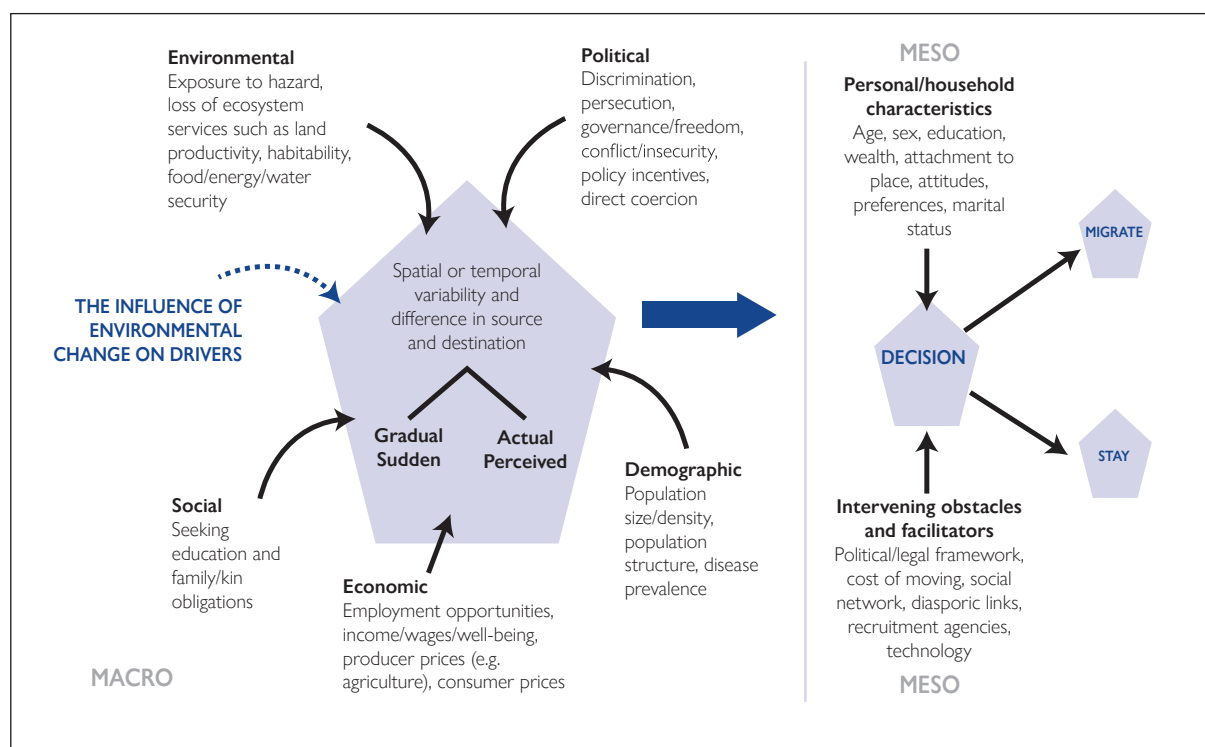
### 2.1. CONCEPTUAL AND ANALYTICAL FRAMEWORK

Academic literature highlights that migration is “an extremely varied and complex manifestation and component of equally complex economic, social, cultural, demographic and political processes operating at the local, regional, national and international levels” (Loneragan, 1998 as cited in Warner, Afifi, Stal, & Dun, 2009, p. 204). As such, climate change is rarely the only driver of human mobility but instead interacts with other livelihoods, human settlement, or safety issues to trigger mobility. Following the WFP, IOM, & FAO (2018), which is the precursor to this study and as guided by the IOM, this study also adopts the conceptual framework developed by Foresight (2011). Foresight’s framework identifies five macro level drivers, as well as meso and micro level factors influencing the micro level decisions on human mobility. The macro level drivers are environmental drivers, such as exposure to natural disasters and loss of food, water and energy security; political drivers, which include persecution, conflict and discrimination; social drivers, such as educational aspirations and family obligations; economic drivers, including employment opportunities; and lastly, demographic drivers such as changes to the population and the prevalence of the disease. The threats posed by these drivers can be either actual or perceived and they may result from gradual changes and events or sudden shocks. Regardless of their manifestation, these drivers often push affected individuals to make decisions on whether they should remain where they are located or move to a different, more attractive, or safer destination.

As noted previously, the decision on whether to move is further influenced by meso and micro level factors. The underlying meso level factors can be identified as facilitators or intervening obstacles that influence a mobility decision, such as the country or state’s political and legal framework, the costs associated with moving and the existence of social networks in both their home and place of destination and so on. The corresponding micro level factors affecting the mobility decision include age, gender, education, marital status, wealth and other preferences, which determine whether mobile persons choose to leave or remain (see Figure 2 – 1). When conceptualized in this manner, climate change-induced human mobility has many nuances varied by the level of preparedness, duration and level of coercion (Ionesco, Dina; Daria Mokhnacheva; Gemenne, François, 2017). In terms of duration, those who have relocated more permanently are considered long-term migrants, while those who have relocated for a shorter time are considered short-term migrants. In contrast to migrants, those relocated suddenly are mostly associated with displacement. Migrants can also be categorized by the reasons they left their origin location. If migrants have been expelled or coerced to leave, they would be deemed forced migrants, while migrants who have relocated on their own terms for their own reasons would be considered voluntary migrants. While there are many such individual categorizations of migrants, an accurate depiction of a migrant’s situation can be assessed by comparing the nature of their migration regarding these three dimensions. For example, a migrant could be a voluntary, short-term migrant, or a forced, long-term migrant and so on.

Such conceptualization is set within the analytical framework at the intersection of the Sustainable Livelihoods Approach (SLA) and the New Economics of Labour Migration (NELM). The SLA “essentially builds on the assumption that people act to maintain a socially and environmentally sustainable livelihood” (IOM, 2008, p. 38). On the one hand, this SLA’s holistic framework considers people to have various strategies to maintain their livelihoods and when faced with shocks and stresses, migration is adopted as a coping strategy. On the other hand, NELM views migration as a HH level decision instead of an individual-level decision to diversify income sources and reduce risk. When combined as a framework of analysis SLA and NELM, it provides a “way of understanding how HHs respond to climate shocks” and the extent to which human mobility is part of their response (IOM, 2008, p. 39).

Figure 2 – 1 : Foresight's Conceptual Framework for Drivers of Migration



Source: Foresight (2011).

## 2.2 RESEARCH QUESTIONS

Within the above-defined scope and conceptual and analytical framework, the study sets out to answer the six key research questions (RQ) as follows:

- RQ1 : What are the demographics and characteristics of the vulnerable groups that move due to climate change?
- RQ2 : What are the specific mobility patterns relating to climate change ranging from displacement (due to sudden onset disasters), seasonal migration (agricultural and fisheries seasons) to permanent relocation (nature, duration, destination and so on)?
- RQ3 : What are the characteristics of those who decide to move compared to those who stay (livelihood, education level, income level)?
- RQ4 : What is the specific impact of drought and sea level rise on migration?
- RQ5 : What is the impact of human mobility on those left behind, specifically on vulnerable groups and their coping mechanisms (children, elderly and women – female headed HHs)?
- RQ6 : Are there differences in the way that men and women, youth and adults, women as HHHs and people with disabilities are affected by climate change and in their human mobility decisions?

## 2.3 DATA

The analysis presented in this report is based on primary data collected from HHs/individual via a sample survey and qualitative data collected from key stakeholders. All qualitative and quantitative primary data collection from HHs/individuals involved gathering retrospective data about exposure to climate events and human mobility and their dynamics during the past 10 years at the HH level. A HH is identified as a *HH with a mobile individual* if the HH has at least one member lived or living away from the HH. Similarly, when a whole HH has moved, such HHs are identified as a *HH that has moved*. The types of mobility considered are displacement, temporary migration (including seasonal migration) and permanent migration (including permanent relocation).

For the quantitative component, the study involves a sample survey of 1501 HHs. Here, 1201 HHs were sampled from climate-impact vulnerable areas, as depicted in the top panel in Table 2 - 1, while another 300 are sampled from mobility destinations. Furthermore, this sample of 1501 HHs consists of 1105 HHs exposed to mobility and 396 HHs not exposed to mobility.

Locating individuals and HHs exposed to both climate-related hazards and human mobility is challenging. This issue is identified as the “rare elements” problem in the literature. Bilsborrow (2009) shows that it can be addressed by adopting specialized sampling and survey design methods to locate adequate numbers of respondents who fit the scope of the study. Adopting this approach, many climate change related studies have selected geographic locations for field work by focusing on regions vulnerable to the climate impacts under study (Burger, et al., 2014; Burger, Ghosh-Dastidar, Grant, & George Joseph, 2014; IOM, 2009). A similar approach of specialized sampling with multi-stage stratified random sampling is adopted in this study. In the first stage, the country is segregated into areas vulnerable to each of the four climate impacts considered. In the second stage, for each of these climate impact groups, the top three<sup>6</sup> districts with high vulnerability as per the Climate Change Secretariat (2011), are considered.<sup>7</sup> In the third stage, the top Divisional Secretariat Divisions (DSD) vulnerable to climate change impact is identified for the survey, while the second DSD from each district is identified as the backup DSD. Finally, at the fourth stage, 100 HHs, each within the DSDs exposed to the climate change impact under consideration, are randomly sampled. Within each DSD, 67 per cent of HHs are chosen from those exposed to climate impact and human mobility (HHs with mobile persons), while 33 per cent are chosen from those only exposed to climate impact (HHs with no mobile persons). See Table 2 – 1 For a summary of the sampling scheme. This approach is appropriate given that the objective of this study is only to understand the nexus between climate change and human mobility and not to establish the *causal* impact of climate change on human mobility.

In the final stage of the stratified random sampling process, field-level systematic random sampling is pursued by starting from a randomly selected street and HH within the DSD, where the first HH is recruited into the survey based on the screening module<sup>8</sup> of the questionnaire. If a HH is exposed to both climate disasters and has at least one person exposed to human mobility, such HHs are considered for the sample of HHs with mobile persons. Households with exposure to climate disasters but no exposure to human mobility are considered for the sample of HHs without mobile persons persons also referred to as left behind households. After each successfully interviewed HH, two adjoining HHs are skipped and the subsequent HH is considered for the survey based on the screening module. If HHs are located over 100 meters apart, the above skipping to 3<sup>rd</sup> HH is eliminated.

The climate impacts considered here and related mobility are not limited to one climate zone but can occur in and affect multiple areas. Thus, to accurately capture and analyze how the various climate impacts affect those living in different zones, multiple locations from different climatic zones have been selected for the study. The exact selection of districts for the hotspots of floods is based on the Sector Vulnerability Profiles (SVPs) prepared for human settlement and agriculture sectors. Relying on the Climate Change Secretariat (2011), we have identified that floods most affect the sectors of human settlement and agriculture (paddy). In this context, regarding human settlements sector vulnerability to flood exposure, Kalutara district is selected for its inclusion of both urban and rural populations affected by flooding and Ratnapura for its inclusion of rural and estate populations. In the case of the agriculture sector, paddy is severely affected by the intensity of rainfall and prolonged floods. Kilinochchi is selected based on the paddy sector vulnerability to represent the Northern Province and to ensure provincial representation in overall sampling.

While people living in many parts of the island face droughts, those located in the dry and intermediate zones are the most affected. In the case of a drought, irrigation is considered a key sector of vulnerability leading to mobility due to loss or damage to crops and related livelihood issues. In this context, the dry zone districts of Anuradhapura and Hambantota have been selected alongside the intermediate zone district of Monaragala. In the case of a landslide, vulnerability and related mobility are induced through the human settlement sector. Thus, the wet zone districts of Nuwaraeliya and Kegalle and the intermediate zone district of Badulla<sup>9</sup> are selected. Given that Sri Lanka is an island with many coastal areas, those susceptible to rising sea levels are spread across all three climatic zones. The sector profile considered for identifying hotspots on sea level rise is marine fisheries and the associated livelihood

<sup>6</sup> In two instances as explained in the text, districts were considered to ensure representation of all the provinces in the country.

<sup>7</sup> If a district in one climate impact area is repeated in another climate impact area, it will be replaced with the next vulnerable district for the respective climate impact.

<sup>8</sup> Screening Question 1: Was this household (or any of its members) exposed to any of the following climate events during the last 10 years ?. Screening Question 2: During the last 10 years did any member/s in this household leave or intend to leave home due to displacement or migration?

<sup>9</sup> Ratnapura is skipped since it is already included under flooding, and thus landslide related information would also be collected when surveyed



vulnerabilities that lead to mobility. In this context, Puttalam and Matara are selected due to being within the top 5 districts<sup>10</sup> and Ampara district is included despite being ranked 13<sup>th</sup> and identified as having Minimal Vulnerability, to ensure the provincial representation. Moreover, Puttalam and Ampara are dry zone districts, while Matara is from the intermediate zone.

Most of these 13 districts selected for data collection for this study may have been affected by multiple hydro-meteorological hazards/climate-related hazards focused on the study and beyond. However, within its scope and resources, specific districts were selected under the four researched climate-related hazards as per the SVPs developed by the Climate Change Secretariat (2011) to understand their main implication on mobility. Nevertheless, after being selected for the study under a specific climate hazard (to streamline the sampling process), data collection and analysis focused on most other types of climate hazards faced.

Literature notes that focusing only on areas of origin has the potential to lack data on the outward- mobility of whole HHs. If the characteristics and factors leading to mobility and consequences of mobility are different between those moving alone versus those moving as a HH, this could lead to selection bias in identifying the characteristics of migrants as compared to non-migrants (IOM, 2009). To address this possible issue, this study samples HHs from mobility destinations. For flood related temporary residential instability, mobility is assumed to be within the district affected. As such, respondents are sampled from Ratnapura. In the case of drought and floods, mobility is triggered by the impact on livelihood in addition to residential instability (Slycan Trust, 2020). Given its attractiveness to economic migrants, Colombo and Gampaha are identified for random sampling of drought and flood-exposed economic migrants. Similarly, given the high incidence of landslide-related relocations and resettlement, Kegalle is considered for the sampling of destination. In the case of sea level rise, seasonal migration related to livelihood instability and variability is considered and respondents are sampled from Trincomalee. In mobility destinations, some respondents are individual migrants while others are individuals who belong to moved HHs. Regarding individual mobility respondents, in addition to individual information, HH level information pertaining to the HH at the place of origin was collected to ensure consistency in data collection across all sites.

Table 2 - 1: Geographic Distribution of Multi-Stage Random Sampling

Climate Impact	District	DSD
<b>Origin</b>		
Flood	Ratnapura	Elapatha
	Kilinochchi	Karachchi
	Kalutara	Bulathsinhala
Drought	Anuradhapura	Horowpathana
	Moneragala	Thanamalwila
	Hambantota	Sooriyawewa
Landslide	Badulla	Kandaketiya
	Kegalle	Aranayake
	Nuwara Eliya	Walapane
Sea level rise	Ampara	Karaitivu
	Puttalam	Mundalama
	Matara	Weligama
<b>Destination</b>		
Landslides	Kegalle	Aranayake
Sea level rise	Trincomalee	Kuchchaveli
Flood and Drought	Colombo	Dehiwala, Wellavidiya
	Gampaha	Mahara, Kelaniya

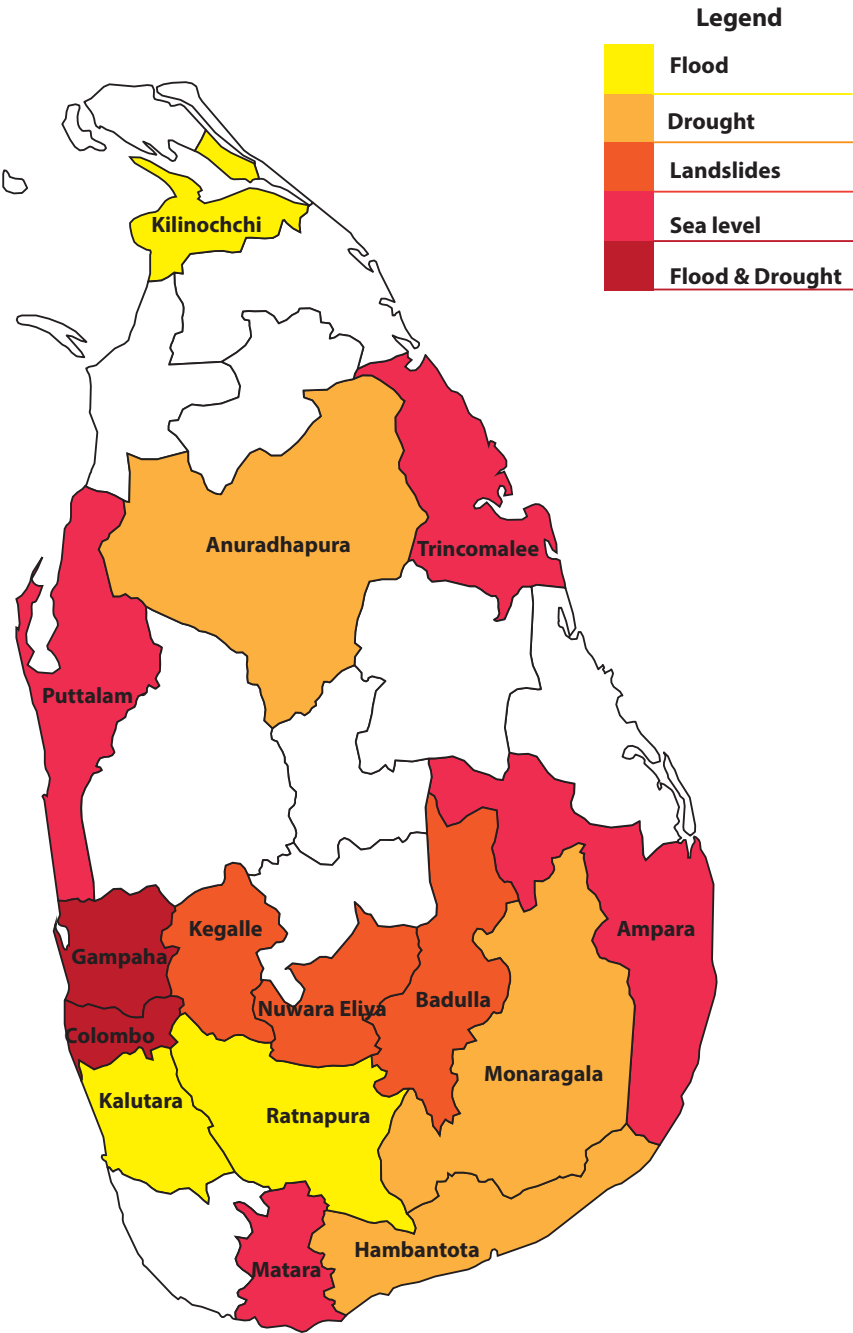
Source: Authors

<sup>10</sup> Gampaha is excluded due to already being considered under flooding and may capture information related to sea level rise as well

Data were collected from the HHH or available adult respondents in the HH as per the predetermined questionnaire and interview guides. As such, guided by the literature and the research questions covered in this study, the survey questionnaire covered individual and HH level demographic, socio-economic, mobility and climate change characteristics; in addition, it covered the self-reported impact of climate change and mobility and counterfactual scenarios to mobility and climate change.

The qualitative data component consists of Key Informant Interviews (KIs), Focus Group Discussions (FGDs) and case studies. Qualitative data were collected from 30 KIs for which respondents were selected based on maximum variation sampling. In doing so, the purpose was to capture a diverse cross-section of respondents, including the climate change exposed population as well as relevant officials and stakeholders. The interviews were based on a pre-determined interview guide covering the key themes relevant to the study and respondents were drawn from the HH

Figure 2 – 2: Geographic Locations of Data Collection



Source: Authors

The KIs comprised seven respondents who have experienced displacement due to sudden onset events, seven respondents who have experienced permanent relocation due to sudden onset events and another seven with seasonal migrants. Additionally, nine KIs were conducted with officials of stakeholders involved in the climate change and migration nexus. Additionally, the study involved three FGDs. The FGDs aimed to draw out richer dynamics and nuances than in KIs. As such, participants for FGDs were recruited based on screening questions to ensure their exposure to climate change issues. The FGDs were conducted utilizing a pre-determined discussion guide, which covered the key themes relevant to the study. The three FGDs focused on displacement, permanent relocation and seasonal migration. The study collected information for five case studies based on FGD or KI participants. Selected subjects were interviewed in detail to develop comprehensive case studies about their exposure and experience with climate change, as well as their experience and views on human mobility. The six case studies focused on unpacking permanent relocation, seasonal migration, displacement, temporary migration and the impact on and coping strategies of those left.<sup>11</sup>

## 2.4 METHODOLOGY OF ANALYSIS

Overall, the study adopts a mixed method approach using both quantitative and qualitative data to answer the key research questions. Quantitative data collection took place through a survey of HHs, while qualitative data were obtained through FGDs with selected HH members in the same areas and KIs with relevant stakeholders and case study approaches.

As noted by IOM (2008, p. 40) and reiterated by WFP, IOM, FAO (2018), when appropriate data is collected “estimates can in principle be made both of the significance of climate change and variability as shocks and stresses and the significance of migration [human mobility] as a response”. In this spirit, in answering RQ 1 – What are the demographics and characteristics of the vulnerable groups that move due to climate change?, data from HHs exposed to mobility from the quantitative survey are used descriptively to develop demographic profiles of the four vulnerable groups that migrate due to climate change identified previously. Similar profiles are developed for individuals that have been exposed to mobility. The profiles are developed to showcase the demographic, social and economic characteristics of vulnerable groups that migrate due to climate change.

By comparing the above mentioned profiles of vulnerable groups that experience human mobility when faced with climate change with those who are vulnerable but have not pursued mobility, we aim to answer RQ3 – What are the characteristics of those who decide to move as compared to those who stay? For this, the profiles developed for RQ1 are replicated to non-mobile HHs and individuals, with particular attention to differences in income level, education level and livelihood to address RQ3. This descriptive analysis is further supplemented with an econometric analysis of determinants of mobility of vulnerable groups due to climate change. Here, the outcome variable is a dichotomous variable, which indicates mobility status ( $M_i$ ), where  $M_i=1$  for those who have been mobile and  $M_i=0$  for others, where  $i$  indicates the individual  $i$  in the individual level analysis or HH  $i$  in the HH level analysis (see Equation 1). This outcome variable  $M_i$  was regressed in a Logit model against a vector of variables denoted by  $X_i$ , which include demographic, social, economic and climate change variables. The marginal effects from the Logit model indicate the specific correlation of income, education and livelihood on the probability of migration. Two analyses are carried out separately at the HH and individual levels and both analyses are based on data from the entire sample.

Equation 1

$$P(M_i) = \frac{\exp\{X_i\beta\}}{1+\exp\{X_i\beta\}}$$

It is important to note in the analysis that human mobility involves ‘self-selection’, as those who decide to move are not randomly picked from the population/community. Instead, mobile individuals have specific characteristics that prompt them to pursue mobility, while others do not. Nevertheless, in the absence of data from a randomized control trial (RCT) or a natural experiment, observational data collected in the survey associated with this study cannot easily address this issue of self-selection. As such, in this analysis of mobile versus non-mobile individuals, an appropriate caveat for the self-selection issue is needed.

<sup>11</sup> All data collection was carried out from February to June 2022.

In answering RQ2: What are the specific human mobility patterns relating to climate change ranging from displacement (due to sudden onset disasters), seasonal migration (agricultural and fisheries seasons) to permanent relocation (nature, duration, destination and so on)?, three separate profiles are developed for each type of mobility considered with the view of understanding their similarities and differences through a descriptive analysis focusing on the nature, duration and destination of mobility and nature of climate disaster and destination of mobility and so on. This descriptive analysis of quantitative data is reinforced with qualitative data analysis. The qualitative data analysis involves identifying key themes emerging from each mobility pattern as well as the development of three detailed case studies.

To Answer, RQ5: What is the impact on those left behind, especially on vulnerable groups and their coping mechanism? (the vulnerable groups considered would be children, elderly, women and female headed HHs), the quantitative analysis is supplemented with a qualitative analysis and a case study to trace any recurring patterns. Similarly, for RQ6: Are there differences in the way that people are affected by climate change and in their human mobility decisions?, a descriptive analysis of the quantitative data collected is conducted while paying attention to gender, age, gender of HHH and disabilities. In answering RQ4: Implications of drought and sea level rise on migration, a detailed qualitative analysis is conducted to identify the key themes emerging from the data. Additionally, a detailed case study is developed for each climatic event.

Findings from quantitative methods are triangulated with qualitative data to arrive at a holistic and in-depth understanding of all RQs.

## 2.5 LIMITATIONS

The study collected data pertaining to exposure to climate events and mobility within the last 10 years. To provide information for the survey, respondents were required to recall exposure to climate hazards and human mobility of HH members during this time window. When recalling information from far-off events, systematic errors probably occur due to the differences in the accuracy or completeness of the information “recalled” by respondents. As such, findings pertaining far off events need to be interpreted with caution.

This study covers the nexus between climate change and human mobility, which is highly influenced by a myriad of other factors not limited to poverty. Given that this study does not set out to isolate the causal impact of climate change on migration, the findings emerging from this study should not be interpreted as the impact of climate change on human mobility. Instead, the findings should be interpreted as the association between climate change and human mobility. At the same time, due to time and resource constraints, the study only focused only on floods, landslides, drought and sea level rise/sea erosion/salinity. The main analysis and findings are limited to these four types of climate events and their association with human mobility.

### 3. CHARACTERISTICS, TYPES AND VARIATION IN MOBILITY

Climate change may induce the movement of individuals as temporary or permanent migration, displacement or relocation. This phenomenon is also affected by specific conditions faced by migrants and their families. These include personal and HH level characteristics as well as external factors. These include the nature of the climate event they are exposed to, social, economic and political factors in their place of origin and the destination they may choose to migrate to. The chapter aims to create an extensive understanding regarding the communities that face such climate events and their experiences with mobility. Accordingly, section 3.1 of the chapter presents the characteristics of those who decide to move compared to those who stay by addressing RQ3.<sup>12</sup> An econometric analysis of determinants of mobility at the individual and HH levels follows this descriptive analysis. Section 3.2 examines the sample by type of mobility and focuses on displacement, temporary, seasonal and permanent migration to address RQ2.<sup>13</sup> The final part of the chapter deals with RQ6,<sup>14</sup> which deals with the differences in the way that men and women, youth and adults, women as HHHs and people with disabilities are affected by environmental change and their migration decisions. This analysis adopts a descriptive approach using quantitative data from the survey, to examine how each of the above mentioned characteristics affects the combined exposure to environmental change and migration decisions. The analysis is presented separately for each pair of groups considered, followed by a chapter summary.

#### 3.1 MOBILITY VS STAYING BACK

At the HH level, HHs without a single individual who has not experienced human mobility are referred to as *left behind HH*, while at the individual level, any individual who has not experienced human mobility is referred to as a *left behind individual*. Among the 1501 HHs in this sample, 1105 (74%) have experienced some type of mobility while the others (26%) have not. Thus, there were 396 left HH in the sample. Similarly, at the individual level, there were 3364 mobile and 2360 left behind individuals (see Figure 3 - 1). The mean age of the full sample was 34.16 and there is only a minor and negligible difference in the mean ages of mobile and stay behind populations, with 34.20 and 34.14 years, respectively. However, in the visualization of the age distribution as depicted in Figure 3 - 2, while mobile persons are relatively more concentrated in approximately around age 20 to 40 years, the age distribution of left behind persons is more spread out from around the ages of 10 to 60 years. This indicates that mobile persons are more concentrated in the prime working ages. Similarly, while in the full sample, the gender split is near equal at 51 per cent females and 49 per cent males (see Figure 3 - 1), among the mobile persons in this sample, a slightly higher percentage of men (52%) is seen. At the same time, there is a notable higher proportion of females at 55 per cent among left-behind persons. This depicts that the proportions of males among the migrants are higher than females but the proportion of males among left behind is less than the proportion of females. These gender differences across mobile and left behind populations indicate that females are likelier to be left behind.

Additionally, in the case of marital status across both left behind and mobile persons groups highest share is reported as married at around 54 per cent, followed by unmarried at around 43 per cent.<sup>15</sup> This depicts that overall, in both categories the percentage of married is higher than the unmarried percentage. Furthermore, in the case of education levels, most left behind and mobile persons are educated up to grades 6-10 with similar percentages of the total. Overall, the education across both groups is concentrated from first to 13<sup>th</sup> grade, with the difference of grades 1-5 and passing O/L taking almost equal shares among mobile persons. Only a very few post-graduates are reported.

Regarding employment among mobile persons, 45 per cent are employed, while a relatively smaller share of 37 per cent of the non-mobile is reported as employed. At the same time, 22 per cent of left behind persons and 18 per cent of mobile persons have reported as unemployed.

<sup>12</sup> RQ 3: What are the characteristics of those who decide to migrate as compared to those who stay (livelihood, education level, income level)?

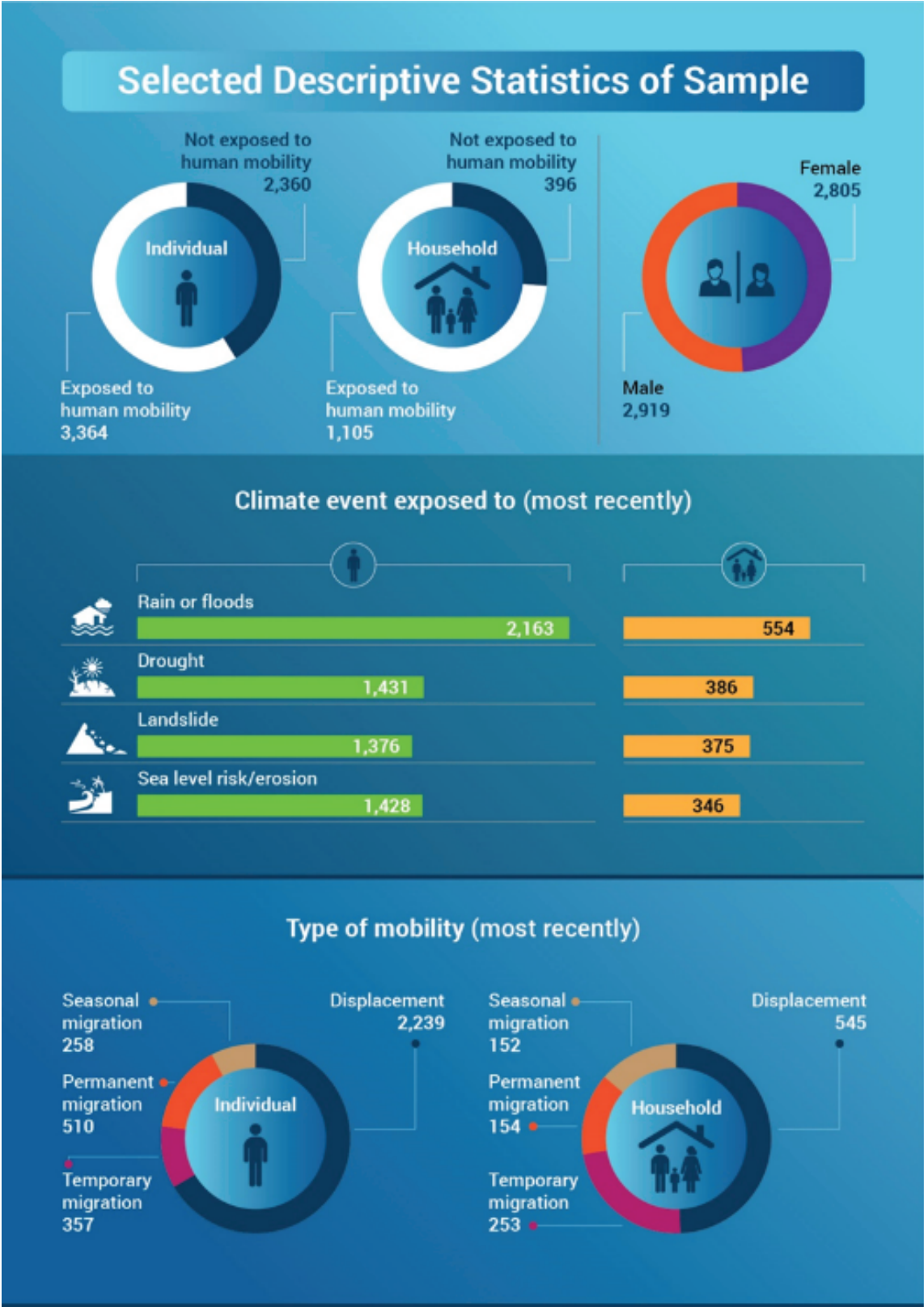
<sup>13</sup> RQ 2: What are the specific mobility patterns relating to climate change ranging from displacement (due to sudden onset disasters), seasonal migration (agricultural and fisheries seasons) to permanent relocation (nature, duration, destination, and so on)?

<sup>14</sup> RQ6 Are there differences in the way that men and women, youth and adults, women as heads of households and people with disabilities are affected by climate change, and in their human mobility decisions?

<sup>15</sup> These shares are consistent with national level figures of 51% married persons as per 2012 Census.

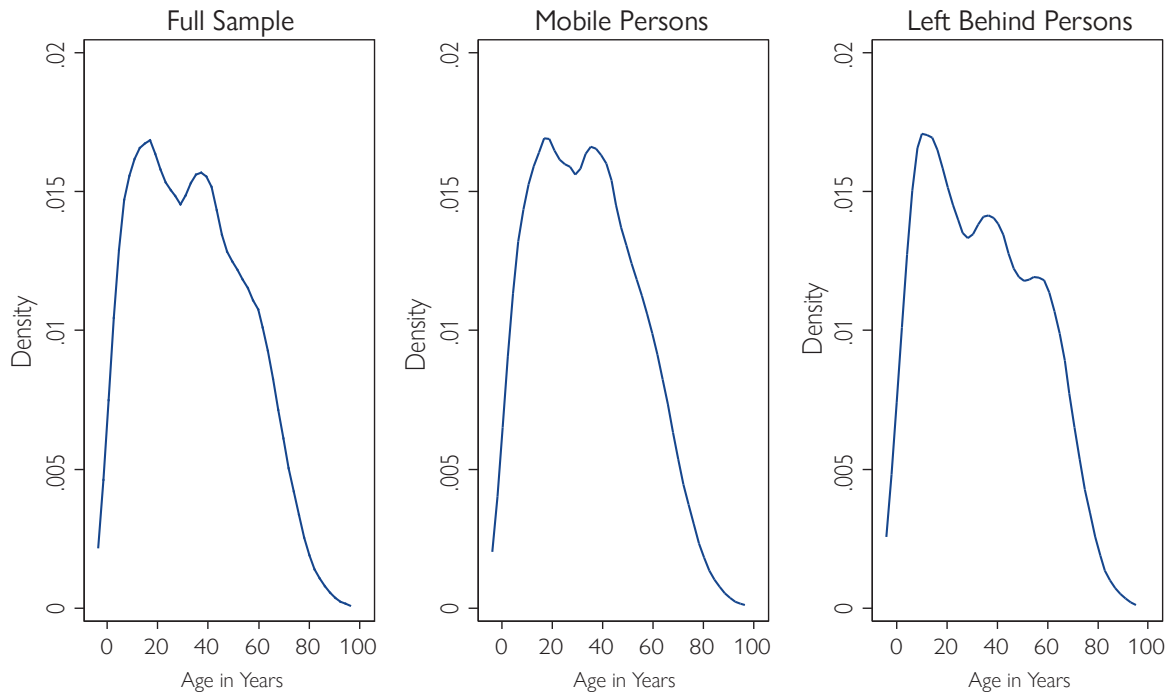


Figure 3 - 1: Selected Descriptive Statistics of Sample



Source: Authors

Figure 3 - 2: Age Distributions



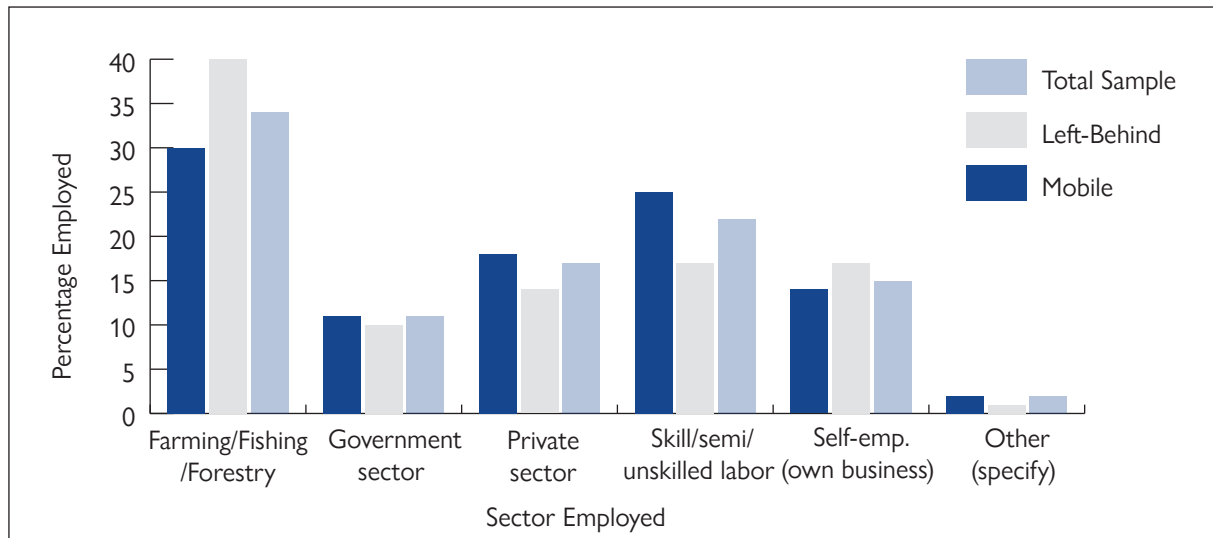
Source: Authors

The relatively higher share of employed and relatively lower share of unemployed persons among the mobile population hint the possibility of expansion of livelihood options with mobility. This is further supported by the greater concentration of males and those in the prime working age in the mobile persons group.

In examining the livelihood options, among all left behind persons, the predominant livelihood option is farming which accounts for 40 per cent of all left behind persons. Other livelihood options such as private sector, labourer jobs and self-employment are reported in the range of 14-18 per cent of left behind persons. In the case of mobile persons, while farming is reported by 30 per cent, it is closely followed by 25 per cent laborer jobs in skilled, semi-skilled or low-skilled levels. At the same time, 18 per cent of mobile persons have reported private sector jobs. Furthermore, the number of self-employed individuals is the highest, even larger than the representation within the total sample, among the non-mobile individuals. Thus, Figure 3 - 3 confirms greater livelihood options, specially within the private sector and laborer jobs associated with mobility. These findings indicate that mobility is associated with greater livelihood options. However, the average income of the two groups does not reflect a difference.

Specifically, when the average monthly income of left behind persons was Sri Lankan Rupees (LKR) 27,852.42 with a standard deviation of LKR 44,441.34, mobile persons' average monthly income was LKR 27,669.16 with a standard deviation of 38,245.92. While the average monthly income of left behind persons was higher by LKR 183.26, this difference is negligible as a share of the monthly income in this sample (Table 3 – 1).

Figure 3 - 3: Livelihood Activities of Employed Persons



Source: Authors

More aspects of livelihood can be discerned at the HH level. As such, next, the analysis focuses on HHs with and without mobile persons. This sample includes 396 HHs without mobile persons and 1105 HHs with mobile persons. Among the full sample, the mean monthly HH income was LKR 42,243.75. Here, the HHs with mobile persons reported a higher mean of LKR 43,363.72, while the left behind HHs' average was LKR 4,296.14 lower (see Table 3 – 2).

Regarding ownership of assets, both types of HHs – HHs left behind and those with mobile persons- have a high ownership of land, while a slightly higher ownership is recorded for the latter type of HHs. Similarly, over half of the houses in each group have reported ownership of crops or plantations, with left behind HHs reporting more at 55 per cent as opposed to 53 per cent among HHs with mobile persons. However, the ownership of other items is higher among HHs with mobile persons. For instance, the ownership of buildings is much higher among HHs with mobile persons, with a gap of approximately 9 percentage points. Similarly, regarding vehicle ownership, the gap is 3 percentage points higher, while for animals, the gap is about 2 percentage points. However, the gap between the two types of HHs for ownership of machineries/tools/equipment is substantial for left behind HHs at 16 per cent, which is almost 8 percentage points behind HHs with mobile persons. Overall, in terms of HH level income and assets, HHs with mobile persons appear wealthier than left behind HHs.

Among both types of HHs, near equal proportions of HHs with at least one person in farming, with a slight majority among left behind HHs at 62 per cent, as opposed to 60 per cent among HHs with mobile persons. However, pertaining to ownership of land used for agricultural activities, a clear majority by 12 percentage points is evident among left behind HHs. These notable differences among the two groups in the case of ownership of agricultural land are against the backdrop of previously discussed near-equal ownership of land in general under assets.

This indicates that ownership in agricultural land is closely linked with HHs not having a migrant from the HH. This may be due to the greater opportunities for livelihood at the region of origin associated with agricultural land ownership. Regarding the types of agricultural livelihoods involved, growing other food crops accounts for the largest share among both groups. Among left behind HHs, this accounts for 41 per cent of HHs, while it is 33 per cent among other types of HHs. The next most popular agricultural livelihood is paddy farming, which includes 27 per cent and 19 per cent of HHs left behind and HHs with mobile persons, respectively. While fisheries activities are negligible among left behind HHs, this is an important livelihood among HHs with mobile persons. For instance, in the latter group, nearly 13 per cent HHs have reported this as their livelihood. Another key agricultural livelihood reported is animal husbandry, where 10 per cent of left behind HHs and 9 per cent of HHs with mobile persons have been reported.

Table 3 – 1: Descriptive Statistics of the Sample

Characteristics	Persons not mobile		Persons mobile			Persons not mobile		Persons mobile				
	No.	%	No.	%		No.	%	No.	%			
Gender	Female	1310	55.51	1609 1755	47.83 52.17	Activity	Employed	867	36.74	1,514	45.01	
	Male	1050	44.49				Unemployed	516	21.86	595	17.69	
Marital Status	Unmarried					Student/child/elderly	Retired	29	1.23	31	0.92	
							Differently abled	15	0.64	15	0.45	
	Married						HH work		63	2.67	99	2.94
								Do not know	186	7.88	230	6.84
	Other							Occupation	Farming/Fishing +	352	14.92	463
Education	N/A	80	3.39			Government sector		117	4.96	194	5.77	
	No education	188	7.97				Private sector		123	5.21	277	8.23
	Grade 1-5	503	21.31			Skill/semi/unskilled labor			151	6.40	377	11.21
	Grade 6-10	668	28.31			Self-emp. (own business)		149	6.31	211	6.27	
	O/L passed	364	15.42			Other (specify)		9	0.38	29	0.86	
Grade 11-13	303	12.84			Not applicable		1,459	62.00	1,813	54.00		
A/L passed	195	8.26										
Diploma	13	0.55				Income	Mean	27,852.42			27,669.16	
Undergraduate	22	0.93					Std. deviation	44,441.34			38,245.92	
Graduate and Postgraduate	24	1.02					Minimum		1,000		250	
Other							Maximum	750,000			1,000,000	
						Age	Mean	34.20			34.14	
							Std. deviation	21.51			20.07	
							Minimum	0			0	
							Maximum	91			93	

Table 3 – 2: Income, Assets and Livelihoods at Household Level

		Left behind HHs		HHs with mobile persons	
HH income (LKR)					
	Mean	39067.58		43363.72	
	Std. deviation	38614.42		42024.15	
	Minimum	2000		1000	
	Maximum	500000		600000	
		No of HHs	%	No of HHs	%
Asset ownership					
	Land	322	81.31	856	83.76
	Crops/Plantation	218	55.05	456	52.78
	Animals	40	10.10	101	12.39
	Buildings	110	27.78	343	36.61
	Vehicles	162	40.91	401	44.21
	Machineries/tools/equipment	64	16.16	212	23.85
Livelihood					
Involved in agriculture and Aquaculture		244	61.62	660	59.73
Owning agricultural land		193	48.74	405	36.65
Activity					
	Paddy farming	104	26.26	204	18.46
	Other food crops	161	40.66	364	32.94
	Animal husbandry	40	10.10	95	8.60
	Aquaculture (internal)	2	0.51	28	2.53
	Fisheries (coastal)	11	2.78	143	12.94

Source: Authors

Exposure to climate events affects one's livelihood. As evident from this sample, interesting trends emerge when loss of livelihoods is disaggregated by mobility status and type of climate event faced. Across both types of HHs considered here, the most share of loss of livelihoods is reported when faced with floods. This share reported by mobile HHs is 6 percentage points higher than that of left behind HHs. In the case of left behind HHs, both drought and landslide have affected the same share of HHs, while in the case of mobile HHs, landslides and sea level rise account for higher shares. Moreover, among mobile persons, livelihood issues at the origin are important reasons for mobility. As shown in the bottom panel in Table 3 – 3, half of the mobile persons have identified unreliability of harvest and related lack of food security as an economic reason for mobility. Another prominent reason reported as a coping strategy for mobility is the absence of land available for farming or agricultural activities. Similarly, livelihood-related factors at the destination have served as pull factors in reasons for mobility. Specifically, 48% of the mobile population reported that higher income opportunities at the destination regions. This was a reason for their migration, while for 9 per cent, employment opportunities at the destination countries were a reason.

Table 3 – 3: Livelihoods and Economic Reasons for Mobility

	Left behind HHs		HHs with mobile persons	
	No	%	No	%
Loss of livelihoods				
Floods	99	25	345	31
Drought	59	15	169	15
Landslide	58	15	201	18
Sea	50	13	193	17
Salinity	23	6	36	3
			Mobile persons	
Economic reasons for the most recent <sup>1</sup> mobility			No	%
Not enough income from livelihood sources			17	2
Unreliable harvest/lack of food security			547	50
No land available for farming/agriculture			188	17
Crop failure			24	2
Job opportunity in destination			104	9
Higher-income in destination			526	48

Note: 1. Most recent event between 2012-2022

Source: Authors

The analysis shows that, while agricultural livelihoods are prominent among the sample exposed to climate events, these are more closely associated with HHs left behind. However, it is vital to exercise caution when interpreting, as the findings only reveal a higher incidence of HH members involved in agricultural livelihoods. Such HHs are left behind and a higher incidence of mobile persons originate from wealthy HHs. As such, it is unclear if mobility resulted in greater livelihood options and assets or if the prior existence of greater livelihood options and assets enabled such persons/HHs to become mobile persons/HHs.

### 3.1.1 Determinants of Choice to Move or Stay Back - an Econometric Model

In the econometric analysis of determinants of mobility among those exposed to climate change, the outcome variable is considered a dichotomous variable, which indicates mobility status (M), where M=1 for those who have moved and M=0 for others. Panel 1 below depicts the determinants of mobility at the individual level, while Panel 2 corresponds to the determinants at mobility at the HH level.

Table 3 – 4: Determinants of Individual and Household Level Mobility when Exposed to Climate Change

	Individual mobility (moved=1, not moved=0)		HH level mobility (moved=1, not moved=0)	
	Panel 1		Panel 2	
	Coef.	P>z	Coef.	P>z
Gender (Female)	0.236*	0.001	0.181	0.382
Age	-0.009*	0	-0.011**	0.064
<b>Marital status</b>				
Married	0.745	0.582	-0.830*	0.016
Divorced	1.537	0.268	-0.232	0.794
Separated	1.037	0.364	-0.479	0.393
Widowed	0.692	0.983	-1.59	0.2
Other	-0.725	0.421		



<b>Employment status</b>				
Employed	-0.254	0.535	0.853	0.389
Unemployed	-0.061	0.672	0.494	0.375
Student/child/elderly	-0.188	0.143	1.108	0.129
Retired	-0.577	0.259	0.402	0.701
Differently abled	-1.035*	0.015	0.755	0.404
HH work	-0.271	0.263	0.526	0.615
<b>Level of education</b>				
No education	0.633*	0.003		
Grade 1-5	0.495*	0.014		
Grade 6-10	0.592*	0.003		
O/L passed	0.661*	0.001		
Grade 11-13	0.533*	0.009		
A/L passed	0.395**	0.078		
Diploma	0.423	0.323		
Undergraduate	-0.06	0.881		
Graduate	0.187	0.65		
<b>Type of occupation</b>				
Farming/fishing/forestry	0.37	0.357	0.263	0.752
Government sector employee	0.546	0.183	0.56	0.53
Private sector employee	0.478	0.241	0.046	0.957
Skilled/semi-skilled/unskilled labor	0.531	0.185	0.175	0.833
Self-employed (own business)	0.044	0.916	-0.483	0.536
Other occupations	0.855**	0.069	1.434	0.158
Monthly income (Log)	-0.274*	0	0.022	0.808
<b>Ethnicity</b>				
Tamil	0.303*	0.004	-0.394**	0.089
Muslim	0.706*	0	-0.504	0.9
<b>Ownership of assets</b>				
HH owned lands	-0.107	0.278	0.118	0.566
HH owned crops/plantations	-0.137**	0.099	-0.440*	0.011
HH owned animals	0.240*	0.019	0.277	0.215
HH owned buildings	0.279*	0.001	0.067	0.688
HH owned vehicles	0.021	0.761	-0.168	0.244
HH owned machines/tools/equipment	0.135	0.107	-0.109	0.548
<b>Recent climate disaster</b>				
Recently faced flood/heavy rains	0.304*	0.004	0.23	0.319
Recently faced a drought	-0.195	0.117	0.031	0.91
Recently faced a landslide	0.251**	0.057	0.068	0.812
Recently faced with salinity increase	-0.690*	0	0.143	0.559
Being a differently abled person			0.337	0.146

Source: Authors

Based on the model's results for individual-level determinants of mobility (see Table 3 – 4), 13 variables are statistically significant at the 5 per cent probability level, while three are under the 10 per cent probability level. Gender, age of a differently abled person, levels of education up until finishing secondary education, monthly income, ethnicity, ownership of a few specific assets and some of the recently faced climate disasters are the factors which have a

statistically significant correlation with the mobility decision of individuals. The variable gender/being a male person is positively related to mobility at a 5 per cent significance level. Based on the marginal effects, an individual being a male results in a higher likelihood of moving, which is 5.4 percentage points higher than a female individual. This confirms an element of male sorting in terms of mobility. Age is negatively related to the decision to move; hence, younger individuals have shown a higher tendency to mobility than older people. The higher tendency of younger individuals to move is likely due to young people being more flexible in terms of changing their usual place of residence. This is mainly due to their aspirations to seek better employment and other opportunities outside their areas of origin when faced with climate events. The findings show that with each additional year in age, an individual's probability to move declines by 0.2 percentage points.

Most education levels show a positive and significant (5% and 10% levels) relationship with individuals' decision to move. Individuals who have not received any education and those who have finished education until secondary school are more likely to move. Among these, the highest marginal effect is estimated for General Certificate of Education Ordinary Level (O/L) qualifications. Here, relative to all other types of education qualifications, an individual with O/L qualifications will have a 15.2 percentage points higher probability to move. Similarly, one with no education has a 14.6 percentage point higher probability of moving than one with any other education level. Here, it is interesting to note that having an O/L qualification and No education have similar relationship with the probability to move. This reflects that zero to average educated individuals are more likely to resort to moving.

In terms of the type of occupation, the category identified as other has a statistically significant positive relationship with the probability of mobility. Specifically, switching from any occupational categories of farming, government sector, private sector, or labour jobs to other occupational groups increases one's probability of moving by 18 percentage points. This model reflects that monthly income has a negative and significant relationship with the individual decision to move. Specifically, given that monthly earnings are entered in their log form, for every 1 per cent increase in income, the probability of moving increases by 0.00063 percentage points.

Interestingly, pertaining to the ethnicity of the individuals, this has become a factor affecting individuals' decision to move. For instance, a Muslim individual has a 15 percentage point higher probability to move than a Sinhala individual. Similarly, being a Tamil individual is associated with a 6.9 percentage point higher probability to move than a similar Sinhala individual.

The ownership of crops/plantations at the HH level is negatively related to mobility at a 10 per cent probability level. Based on the marginal effects, an individual whose HH owns crops or plantations has 3.1 percentage point lower probability to move. However, in contrast, those in a HH owning animals or buildings are more likely to move than those not owning such assets. Specifically, an individual from a HH owning a building is associated with a 6.4 percentage point higher probability to move, while the corresponding increase for owning animals is 5.5 percentage points. The opposite direction of the relationship between agriculture-related land ownership and buildings may be due to the uncertainty involved in agriculture and the related income difficulties depriving one from having the initial capital required for mobility.

Concurrently, ownership of assets may reflect a higher capacity to finance mobility and possible alternative income earned from rent, while agricultural land is less likely to earn income other than through agricultural output/crops. However, while ownership of plantation/crops is associated with a lower probability of migration, ownership of animals or livestock is associated with a higher probability to move. This indicates that different activities of agriculture affect the probability of mobility in diverse ways.

Among the climate impacts, two impacts have a statistically significant relationship with the likelihood to move. Specifically, individuals who have recently faced floods or heavy rains are 6.9 percentage points more likely to move than those who haven't experienced such a disaster. Similarly, those who had faced landslides or experienced salinity due to seawater intrusion are 6 and 16 percentage points more likely to move from their living places, respectively, than those who haven't faced such scenarios.

This model for determinants of mobility was estimated on a sample of 4500 records. However, this model has a relatively low pseudo R square value of 0.0547. The low pseudo R square value may be due to the importance of climate conditions and other non-individual level characteristics beyond the scope of this study.

Based on the model's results for the HH level, only four variables are statistically significant at the 5 per cent and 10 per cent probability levels. Age of the HHH, the HHH being a married person, the HHH being a Tamil individual and HH-owned crops/plantations are the factors which statistically significantly acted as push factors in the decision to move at the HH level. The variable age of the HHH is negatively related to the mobility decision; hence, the lower the age of the HHH, the higher the tendency to serve as a push factor to move. Specifically, for every additional year in the age of the HHH, the likelihood for the HH to move declines by 1.1 percentage points. This finding is consistent with the previous finding in terms of the individual-level model. The same interpretation can be extended: younger HHHs are more likely to view mobility more favourably and decide in the entire HH to move. The HHH's marital status has a statistically significant relationship with HH level mobility. For instance, when the HH is headed by a married individual, the likelihood for the HH to move declines by 14.9 percentage points. This can be interpreted as married HHHs are more likely to settle in their place of residence and thus do not view uprooting the entire family as a favourable decision.

In contrast to the results received in individual-level mobility, at the HH level, having a Tamil HHH has negatively and significantly affected the mobility decision of the HHs. Relative to the HHH being Sinhala, a Tamil HHH shows an 8.3 percentage point lower probability to move. Moreover, HH ownership of crops/plantations is negatively related to mobility at a 5 per cent probability level. Based on the marginal effects, a HH that owns crops or plantations is less likely to move; here, the probability of the HH to move declines by 9.1 percentage points. This model is estimated on a sample of 1,169 HHs and the model pseudo-R square was 0.0430. As mentioned in the case of the individual level model, the relatively low pseudo-R square may be due to the importance of non-HH level determinants beyond the scope of this study.

## 3.2 TYPES OF MOBILITY

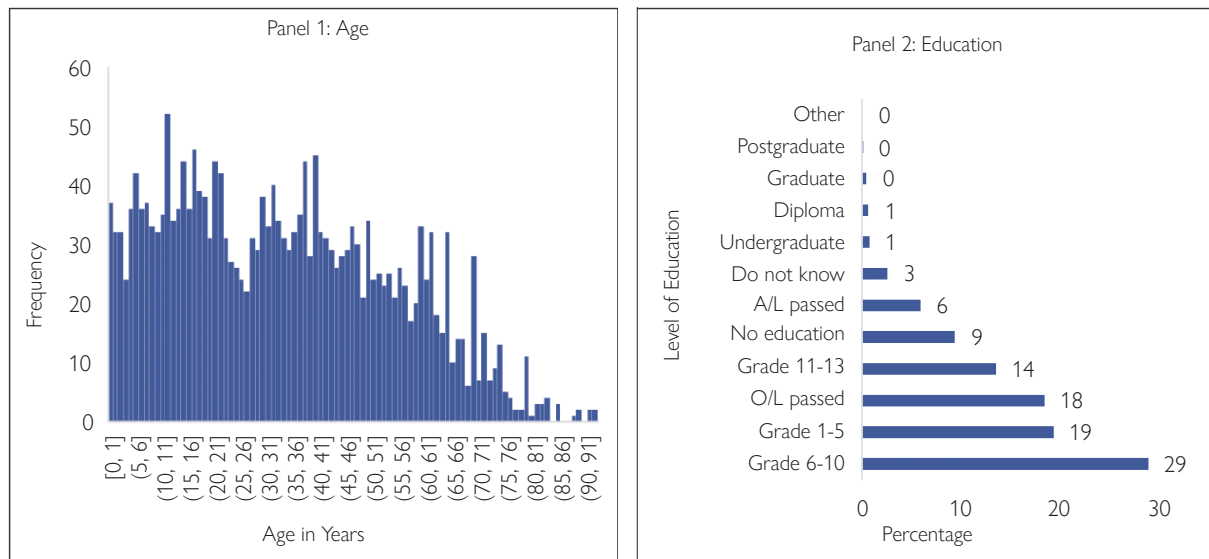
This section of the chapter presents a breakdown of the sample by the four types of human mobility considered: displacement, temporary migration, permanent migration, seasonal migration and the descriptive statistics of sub-samples representing each of these mobility patterns.

### 3.2.1 Displacement

Displacement is the forced removal of people or people obliged to temporarily flee from their places of habitual residences due to several reasons, including risks of climate or natural disasters (Rigaud, et al., 2018). Incidence of such displacements due to rapid onset disasters (such as landslides and floods) is more prominent in the Sri Lankan context (Ministry of Disaster Management, 2016). Displacements are more prominent in all migration rounds, accounting for over two thirds of all individuals. For instance, 2216 individuals have been displaced during their most recent migration round (67%).

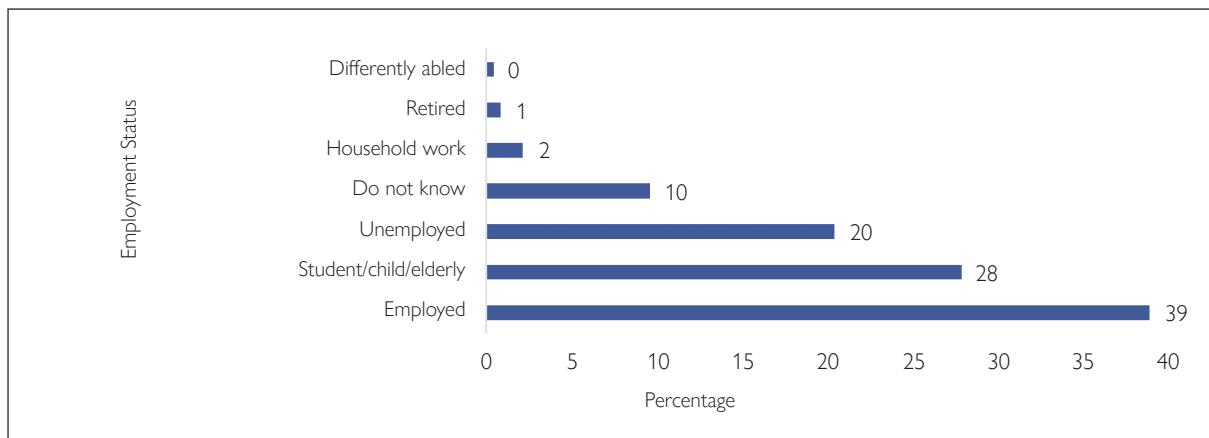
In this sub-sample of temporarily displaced individuals, there were near equal shares of women (51%) and men (49%); the average age was 34 years within the range of 0 to 93 years, which is consistent with the full sample of all mobility types (Figure 3 - 2). In this sample, 29 per cent of displaced individuals were educated up to grade six to ten. Regarding their activity status, 39 per cent were employed, while significant shares were unemployed or not in the labour force (see Figure 3 - 5). These demographic characteristics reflect the absence of an obvious selection process among individuals for displacement.

Figure 3 - 4: Age and Level of Education of Displaced Individuals



Source : Authors

Figure 3 - 5: Employment Status of Displaced Individuals



Source : Authors

Among those who have reported displacement in their most recent mobility event, the majority were exposed to sudden onset disasters like floods (1023 individuals), heavy rains (941 individuals) and landslides (634 individuals), followed by indirect impacts of climate change such as salinity/sea level rise (403 individuals) and human-animal conflicts (116 individuals). One of the immediate responses, when faced with such climate hazards is moving to a safer location. An insight into what is meant by “a rise in the sea level” can be gained by looking at the qualitative data gathered. For some, it is high waves and rough sea during the monsoon periods; for some, it relates to sea erosion and its resultant flooding during monsoon periods, specially, following the newly built harbour (such as in Oluvil) or tourist hotels along the seashore. Furthermore, evidence reveal of difficulties in engaging in the fishing industry due to the change in the terrain, which is now filled with stones left behind/brought by the sea when the rainy season subsides (Karaitivu). Thus, the term sea level rising is used to allude to the usual results like sea flooding that takes place during the monsoon seasons (for example, in the case of Thallalla) or cyclones in the bay areas. These have far worsened in the past few years, especially following tsunami, as some respondents have commented. In some cases, though, the term also refers to the flooding of inland fields and waterways and continuous loss of land to the sea by about 10 meters each time the sea comes into the land following turbulent weather. In almost all cases, the respondents tend to use “rising of sea levels” as an umbrella term to refer to high tide, storms and violent seas. However, a recurring theme was the irregularity and severity of weather conditions in recent years compared to five to ten years ago.

In identifying reasons for displacement, a clear correlation was seen in the sudden onset of events, where 953 reported floods and 620 reported landslides as reasons for displacement (Table 3 - 5). This is mainly due to the relatively short lag between the disaster and displacement. As revealed during FGD and KIs in Bulathsinghala, rising water levels due

to floods necessitated people being evacuated within hours allowing only to grab a few key possessions like national identity cards and birth certificates. Similarly, as evident from the FGD and KIs in Aranayake, the victims of landslides also had to evacuate immediately. One parent recalled the psychological trauma “when the landslide happened, my child did not talk for one and half days, as he was in shock”. She further recalled “I was also very sad and even now...”. On the contrary, a notable gap (see Table 3 - 5) is evident between the number of individuals exposed to drought and sea level rise events and those identifying the same reasons for migration. This was further highlighted during qualitative data collection where only a few respondents could see the connection between the climate issues faced and the resultant livelihood issues, including migration.

Table 3 - 5: Exposure to Climate-Related Hydrometeorological Hazards and Displacement

Climate event	Number of individuals exposed to climate events	Number of individuals identifying climate events as the reason for migration
Floods	1023	953
Drought	404	218
Landslide	634	620
Sea level rise/coastal erosion	403	307

Note: Total may not add to 2216 due to multiple answers

Source: Authors

Considering the nature of migration, the majority (55%) had moved to temporary housing- such as moving into a known person's house such as a neighbour, friend or relative - 33.48 per cent had moved to temporary shelter or camps organized at the community level and 8.94 per cent had moved to shelters at religious places when exposed to climate disasters (Table 3 - 6). The popularity of each type of displacement accommodation varied by the climate event faced. For instance, when faced with floods, sea level rising and human-elephant conflict, most were displaced to temporary housing. In contrast, most sought protection in temporary shelters when faced with landslides. Moreover, when faced with human-elephant conflict, displacement into a temporary shelter or religious places has not occurred as observed with floods or landslides, possibly due to the relatively smaller number of individuals affected by the former resulting in more individual-level coping mechanisms. The high popularity of temporary shelters when faced with landslides reflects that landslides normally affect a large region and evacuation happens to a place somewhat far away from the source of the disaster with a decreased probability of having any known houses. These nuances of temporary displacement were further validated by qualitative data as well. For instance, as highlighted during the FGD held in Bulathsinghala, when flooding starts, the villagers rush to higher ground by taking a few important possessions, such as identity cards and birth certificates. As noted during a KI with an official in Bulathsinghala, has a large group of people were informed in a very short time about hazards using modern technology through methods such as WhatsApp or Viber messages and associated groups. Similarly, Bulathsinghala has a scientific warning system to alert residents to evacuate in time. Specifically, this early warning system contains a community-based rain gauge system provided by the National Building Research Organization and an Automated Rain Gauge system maintained by the same organization. In other areas, less sophisticated systems of informing neighbours or warning the residents over the phone by the Grama Niladari (GN) are in place.

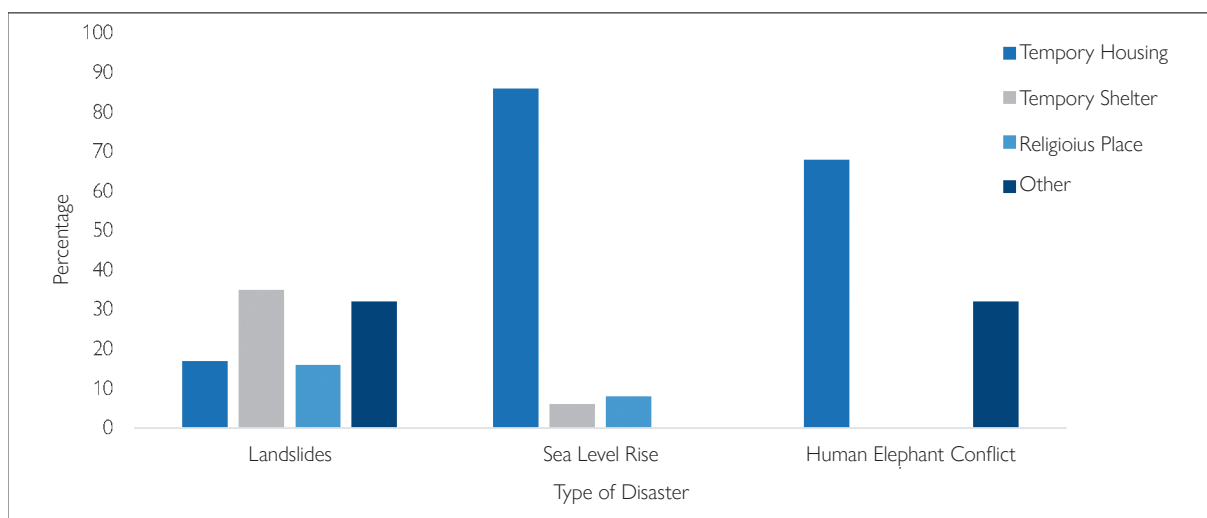
Once alerted, there seems to be a preferred order among victims as to where they would be displaced, if given a choice. As evident during the FGD in Bulathsinghala, when faced with floods, “first, everyone goes to the houses of their relatives. If those houses also get filled with those displaced people or get flooded, then people go to the temple”. When the displaced go to temporary housing, it affects both those displaced as well as those hosting the displaced persons. As highlighted during the discussion, “not only one family that goes, 30 or 40 people go. So, their [hosts'] lives also change. Sometimes they [hosts] have no place to sleep after giving it to the guests”.

Table 3 - 6: Nature of Mobility, in Most Recent<sup>1</sup> Mobility Round

Nature of Mobility	Frequency	Percent
Displaced to temporary housing	1222	55.14
Displaced to temporary shelter	742	33.48
Displaced to designated temporary shelters (religious place)	198	8.94
Other	54	2.44
<b>Total</b>	<b>2216</b>	<b>100.00</b>

Note: 1. Most recent event between 2012-2022.

Source: Authors

Figure 3 - 6: Nature of Mobility, in Most Recent<sup>1</sup> Mobility Round

Source: Authors

On average, such displacement lasted 62 days with a standard deviation of 297 days. This large standard deviation stems from the wide range in the duration of displacement from 1 to 2555 days. As evident in Table 3 – 7, 25 per cent were displaced for one day, while 50 per cent were displaced for 4 or less days. Durations longer than one month were seen for around 10 per cent. As such, it is important to disaggregate the duration of displacement by climate disaster faced. As shown in the bottom panel of Table 3 – 7, the lowest average displacement duration of 3 days was reported for sea level rise. Those exposed to landslides reported the longest average duration of 155 days. The average duration of displacement for human-animal conflicts was 46 days, while for floods, it was 25 days.

The relatively long duration of displacement due to landslides was well explained in qualitative data. Specifically, as evident in KIs, FGD and case studies done in Aranayake, those affected by landslides often do not have a home to return to after the landslide risk has passed. As such, until relocated, those displaced require being accommodated at temporary shelters. Moreover, the relocating process involves a significant period of time to allocate land, allocate funds, disburse funds and build a house. As such, the duration of displacement will stretch from days to months, even to years, in the case of landslides. In the case of floods, victims often had a home to return to, after much cleaning and in some cases, repairs. As revealed during KIs, case studies and FGD in Bulathsinghala, most victims of flooding highlighted how they cleaned their HHs before returning from temporary housing or shelters. As such, flooding has an average displacement duration of 25 days, as opposed to 155 days for landslides.



Table 3 – 7 Duration of Displacement, in Most Recent<sup>1</sup> Migration Round

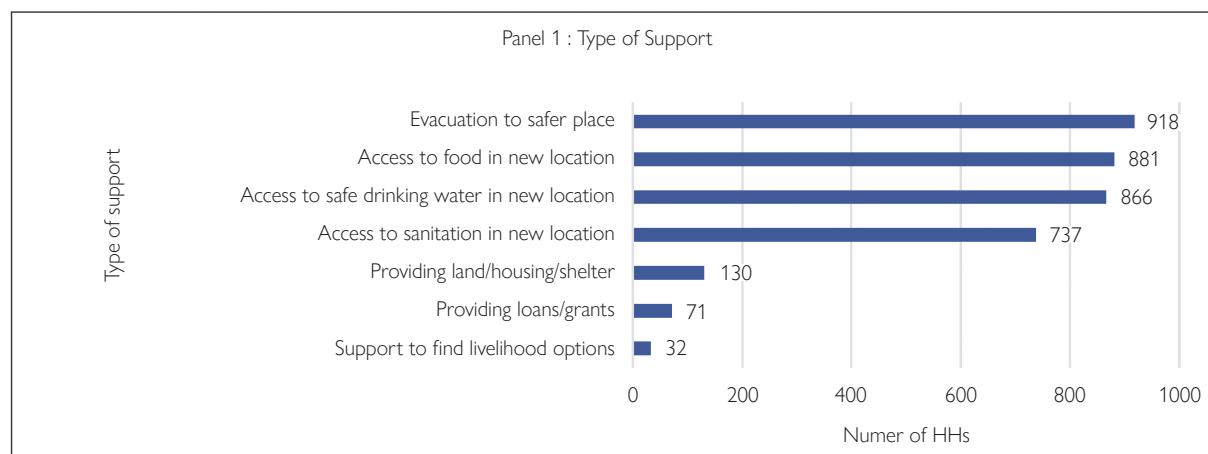
Percentile	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>	95 <sup>th</sup>	99 <sup>th</sup>
Duration (In Days)	1	4	10	30	150	2190
Duration based on type of disaster	Obs.	Mean	Std	Min	Max	
Floods	953	24.71	118.31	1	1460	
Landslides	620	155.09	503.89	1	2190	
Sea level rise	307	3.08	7.34	1	90	
Human animal conflicts	115	45.88	157.75	1	730	
Drought	0	-	-	-	-	

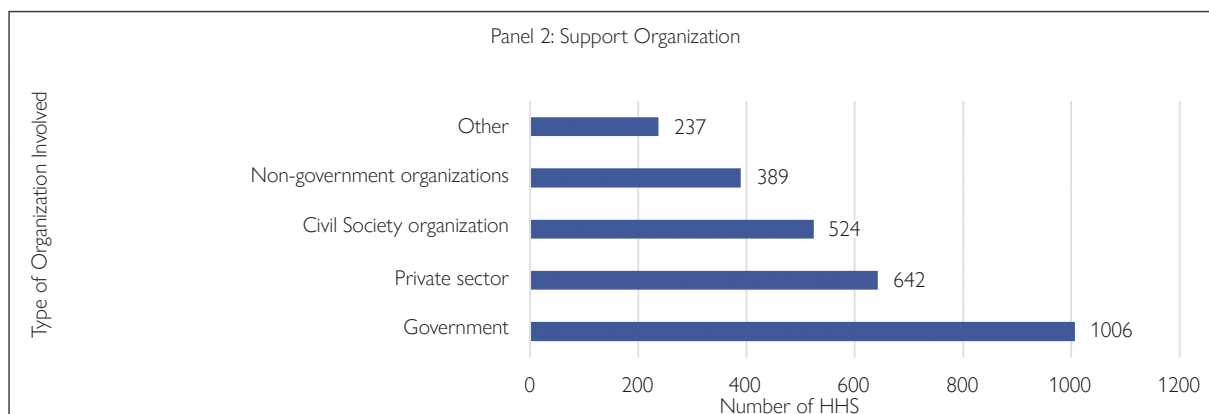
Note: 1. Most recent event between 2012-2022

Source: Authors

Also, concerning support received during the period of displacement, out of 2216 displaced migrants, 774 individuals had stated as not received any type of assistance. However, 1442 individuals had received some type of assistance, as depicted below. In terms of support received, respondents stated that 918 individuals received support to evacuate to safer places, 866 individuals had access to safe drinking water, 881 individuals had access to food and 737 individuals had access to sanitation in the new location. Besides, 130 individuals stated that they received land/housing/shelter for relocation and 71 individuals received loans/grants during the period of displacement. Moreover, 32 individuals found livelihood options during the period.

When considering the type of support provider, 1006 individuals had received support from the national government, while 642 individuals had received support from the private sector, 524 had received support from civil society organizations and 389 had received support from non-government organizations. Additionally, many areas have developed their own societies to cope with climate events. In case of floods, in Bulathsinghala, the community has established the “lhala Welgama Api Avadiyen Sitimu” society, which assists the community as per a pre-developed plan. In the case of displacement in Aranayake, Kegalle, many personal well-wishers supported those affected. One KII respondent noted that, “the shops I gave products brought me goods like food and clothes valued at LKR 700,000. As I could not bring and store these in my house, I donated it to those in the temple...Then, the Muslims in Udathalawa, teachers and other acquaintances brought goods valued LKR 300,000 with 300 ration packets”.

Figure 3 - 7: Type of Support Received and Organization Providing Support During the Period of Displacement, in Most Recent<sup>1</sup> Migration Round



Note: 1. Most recent event between 2012-2022

Source: Authors



Photo 3- 1: Floods in Dankotuwa, Puttalam

Source: Authors



Photo 3- 2 : Floods in Bulathsinghala, Kalutara

Source: Authors



Photo 3-3 : Mundalama, Puttalam  
Source: Authors

The losses and damages experienced were highlighted during the FGD in Bulathsinghala. Even a small flood results in significant losses and damages. As noted by one discussant, “I found the water motor, but by the time I took it [the flooding] was over. I tried to take the refrigerator with me but by then its gas tubes got ruined. There is a photocopy machine at home. Whilst transporting, it got wet and now it does not even switch on”. These losses and damages affect victims’ lifestyles and livelihoods. In addition to quantifiable financial losses and damages, implications of climate events also include social costs. For instance, one discussant at the FGD in Bulathsinghala highlighted that there are times when marriage proposals to residents in these areas were rejected due to their areas being vulnerable to flooding. As mentioned by one parent, “now he [discussant’s son] is at a stage where he does not even want a marriage”.

Access to flood support is also unequal and there are instances of corruption in the distribution of relief and support measures. As highlighted during the FGD held in Bulathsinghala, “the people on higher elevations have received about LKR 13 lakhs, got their houses built. All these were done for them but nothing for us. For the 3 or 4 of us, no one checked. No one cared for us but our houses were the most destroyed”.

When considering the origin and destinations of temporarily displaced migrants, the majority displaced were from the origin areas like Kegalle (14per cent ), Kilinochchi (11%), Kalutara (11%), Ratnapura (11%), Nuwaraeliya (8%) and Badulla (7%), where the sudden onset disasters like floods and landslides are highly prominent. Apart from those areas, 12 per cent and 7 per cent of people were temporarily displaced from the areas like Ampara and Puttalam, respectively, where sea level rise is highly prominent. In this sample, 1,943 have displaced within the district of origin, while only 273 were displaced to other districts. The latter is likely to be the population living closer to a district border. Confirming this, among out of district displacement majority were from neighbouring districts. These facets of displacement were further confirmed in qualitative data collected via KIIs, case studies and FGDs in Aranayake and Bulathsinghala. In contrast, when faced with floods, landslides or human-elephant conflict, individuals wanted to immediately seek shelter in a safe place, which ruled out travelling long distances.

Below is the case study of a HH displaced migrant due to floods in Bulathsinghala, Kalutara.

Mr. Nihal Sanjeewa is from the Ihala Welgama GN division in the Bulathsinhala division of Kalutara district in the Western Province of Sri Lanka. This area falls under the wet zone of Sri Lanka, whereas the main livelihood of many people is tea, rubber and crop plantation.

Mr. Sanjeewa is a father of two children: an elder son (14 years) and a daughter (9 years). At the time of the study, he is 40 years of age and both of his children are still schooling. Tea and rubber plantations are his main sources of income and driving a three-wheeler is his secondary income option, while his wife's income from working in the post office also contributes to the HH income. Previously he ran a grocery shop until it was affected by a flood in 2017.

From 2003 onwards, the village was affected by floods due to heavy rain from time to time. As per villagers' views, the village has been severely affected by floods since the "Kukule ganga project" started in 1999. Before the Kukule ganga project commenced, villagers had enough time to prepare for floods during rainfall. But in 2017, the rain intensity was very high. Concurrently, since the project began, the implications of rain and related flooding have become severe. As a result, in 2017, Mr. Sanjeewa's family along with other villagers experienced severe flooding. Mr. Sanjeewa highlighted that he woke up in the early morning due to the rain and realized that the water level had reached his garden. Reacting immediately, he and his wife packed their important documents in a rush. He said "we only took birth certificates and deeds... We didn't have enough time to take anything". By the time they packed, the water had entered the house. At this point, they quickly evacuated to one of their relative's houses in the upper area of the village by a canoe that was evacuating those affected. Other than the documents packed during this incident, Mr. Sanjeewa's family could not protect most other belongings or assets. The assets affected by the floods included his grocery shop, three-wheeler, tea cultivation and paddy harvest. As he recalled "the floods in the year 2008 had some amount of predictability, where they had enough time to prepare and "we could move our paddy harvest to a higher place". On the contrary, in 2017, they were not able "to get even one bag of paddy" out of the approximately 60 bags of paddy they had in their house. Even his wife's post office and his grocery shop were flooded; but they could not protect these places, as in less than two hours, the low-lying areas in the village were flooded.

As such, all the affected families in the village were temporarily moved into the village's temple or neighboring houses on higher ground. As such, Mr. Sanjeewa and his family stayed at one of their relative's houses on the higher ground of the village. He mentioned that "three or four families stayed in that house". It took about six days for the water level to drop and dry out and during that period of displacement, all food and other essentials were provided by the HH members who sheltered them. As stated by him, "my uncle who saved us during the flood period provided meals and their clothes to us. Sometimes, boats came with food like bread and rice packets. Then the males of the family went to the boats and brought food packets distributed by boats."

After 6-7 days, Mr. Sanjeewa's family returned to their houses. The return process started with cleaning the HH. Here, all neighbours helped each other to clean and repair their houses. As Mr. Sanjeewa highlighted, "there is good support from the neighbourhood. When we cleaned our house, all the neighbours got together and cleaned the houses" and helped each other. "When people ask for help, others come by canoe and take us". After such cleaning and subsequent return, Mr. Sanjeewa's family experienced several difficulties before returning to a normal life. For instance, as stated by Mr. Sanjeewa, "during the flood period, all food was supplied by my uncle and relatives. But when we returned home, there was no food in the home and the flood destroyed all food we had at home. My grocery store was also affected. As such, I had no money to spend. So, I went to a wholesale grocery shop and bought some essentials for my home. That shop owner sent us some essentials like 20kg of rice, sugar, tea and so on. That's how we lived one to two weeks until transitioning to normal life". Thereafter, once he could earn some money and his wife received her salary, they gradually returned to their normal lifestyle. Their return to such normalcy was supported by the government and several other institutions. Specifically, Mr. Sanjeewa had received a grant worth of LKR 89,000 from the government to reopen his retail shop. However, in practice, Mr. Sanjeewa had allocated these funds towards repairing his house and reviving his tea plantation. In terms of rebuilding their house,

Mr. Sanjeewa allocated the funds towards buying paint and overall repair as the house was damaged due to flood-related mud and dirty water. Similarly, the funds for tea cultivation were allocated to buy tea plants. Additionally, the insurance coverage of his three-wheeler provided him money to repair it, while the insurance service provider also provided him with a new battery and a free service.

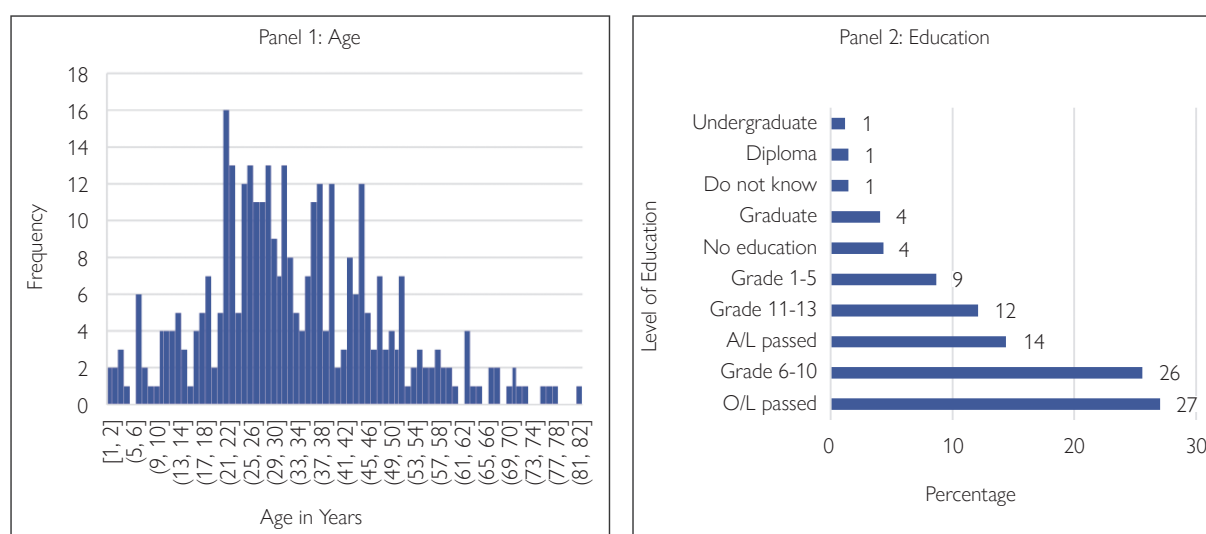
Despite having experienced severe flooding that affected his lifestyle, belongings and assets, Mr. Sanjeewa was satisfied with the support received from his social network.

### 3.2.2 Temporary Migration

Temporary or circular migration is a move made for a short period of time with the intention of returning to the place of usual residence (Keshri & Bhagat, 2010). The reasons behind such temporary migration may include demographic or personal characteristics as well as external factors. These include the nature of the climate event they are exposed to and the socio-economic factors in their place of origin and destination.

In terms of demographic characteristics, in this sample of 348 temporary migrants, two thirds were men (67%), while women accounted for only a third. This is in contrast to the near-equal proportions of men and women among those displaced. Similarly, while the age range in this group was from 0 to 82 with an average of 34 years, the distribution shows a large proportion of working age individuals. As expected, among temporary migrants, an overwhelming majority (70%) are employed (Figure 3 - 9). In this study, 27 per cent have passed O/Ls, while 26 per cent have studied up to grades 6-10 and 14per cent have passed A/L (Figure 3 - 8). This reflects some degree of evidence for selection in terms of education for temporary migration, unlike in the case of those displaced. This is likely because temporary migration is a family-level calculated decision and the family is likely to select the most suitable family member for migration. In contrast, no such selection using of a family member is possible for displacement.

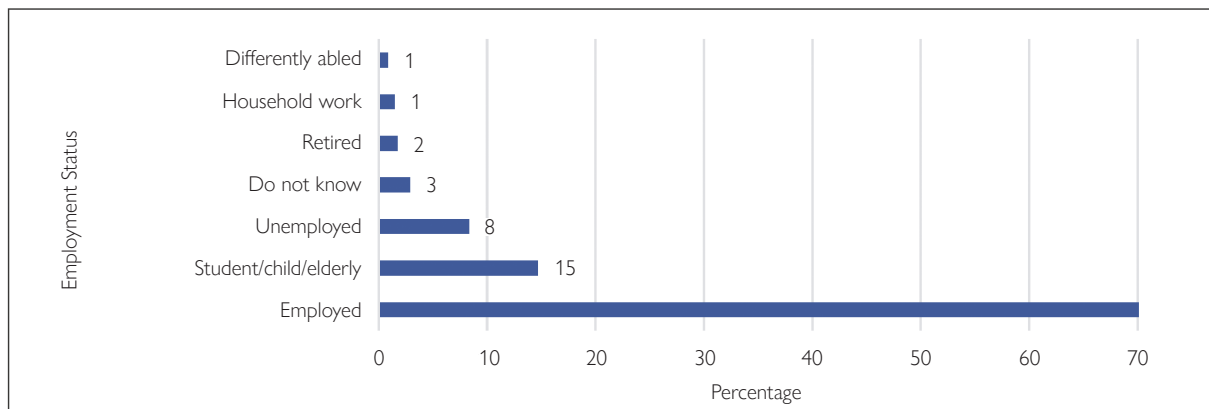
Figure 3 - 8: Age and Level of Education of Temporary Migrants



Source: Authors



Figure 3 - 9: Employment Status of Temporary Migrants



Source: Authors

As depicted in Table 3 - 8, out of 348 individuals who identified themselves as temporary migrants, only a very few had stated climate-related reasons for migration. Among those citing climate events as reasons for migration, 76 individuals reported droughts, while 23 reported landslides and 23 reported human-animal conflicts. Such low reporting of climate events for reasons for migration is in the context of 42 individuals having experienced floods, 199 experienced drought, 63 experienced landslides and 72 experienced sea level erosion. This is in high contrast to the high correlation between rapid onset events and displacement discussed in the previous section. Concurrently, the majority have identified economic reasons such as inadequate income from livelihood sources (211 individuals), availability of job opportunities in destination (215 individuals), higher income in destination (74 individuals), unreliable harvest/lack of food security (63 individuals) and crop failure (37 individuals) as reasons for temporary migration (see Table 3 - 9). This overemphasis on economic reasons despite the climate events highlights the complicated relationship between climate change-related migration, the push and pull factors for migration when faced with climate migration, the challenges in isolating slow onset events and extreme weather events as reasons for temporary migration. Specifically, when 195 individuals experienced drought, only 76 individuals reported droughts as a reason for their temporary migration. Yet 144 have experienced drought and indicated unreliable harvest/lack of food security as an economic reason for migration. This underscores the limited identification of mobility as a response to sea level rise and droughts.

These subtle nuances relating to the nexus between climate change and migration emerged from the KIIs, FGDs and case studies conducted. Specifically, almost all KII respondents identified a clear link between drought and a drop in agricultural income. For instance, as highlighted during one KII in Thanamalwila due to drought, “crop cultivation is damaged... We borrow from a shop. We borrow goods from a shop or borrow from friends and repay it at the end of the month”. Moreover, respondents identified migration as a means of compensating for the loss in agricultural income. One KII respondent noted that those affected by drought “go to nearby people who have jobs and get income. We cannot get that kind of income by chena cultivation”. The same respondent highlighted that “there is no satisfactory income [from agriculture]. Therefore, we go somewhere and work for about a month”. As such, it is interesting to note that nearly all respondents for qualitative data collection from areas prone to drought and sea level rise such as Hambantota, Monaragala, Anuradhapura, Ampara, Puttalam and Matara have not been able to see a direct and a clear nexus between climate change and migration, but were able to link both climate change and migration to livelihoods / income. This underscores the complex link between migration induced by such events.

In terms of the duration of temporary migration (as depicted in Table 3 - 10), the average number of days during the temporary migration is 686 days, with a standard deviation of 1117.73. When disaggregated by type of disaster, the longer duration of migration has been due to droughts (993 days), followed by human-animal conflicts (358 days) and landslides (321 days). As evident in Figure 3 - 10 for temporary migration due to all types of climate disasters, a long right tail pushes the respective average duration up. In the case of drought, the distribution has two clear humps, while the other two have a spike at the left, indicating the concentration of duration at a very few days of duration. In the case of drought, those around the first hump in the duration distribution are likely to be those making shorter trips to balance agricultural activities at home while working away as a temporary migrant, while others may be those who have taken up full time work in the destination. For instance, many KIIs and FGDs in areas of paddy cultivation noted that during the migrants’ absence the rest of the family continued the paddy cultivation activities, while the temporary migrants adjusted their leave/holidays to coincide with the harvesting period and remained at the origin for about two to three weeks to participate in harvesting.



Table 3 - 8: Individual Level Exposure to Climate Events and Climate Events As Reasons For Temporary Migration

Climate events	Number of people exposed to climate events	Number identifying climate events as the reason for migration
Floods	66	10
Drought	195	76
Landslide	62	23
Sea level rise/coastal erosion	70	0

Note: Total may not add to 348 due to multiple answers

Source: Authors

Table 3 - 9: Economic Reasons for Temporary Migration

Economic Reason	Frequency	Percent
Unreliable harvest/lack of food security	211	61
No land available for farming/agriculture	63	18
Crop failure	13	4
Job opportunity in destination	37	11
Higher income in destination	215	62

Note : Total may not add to 348 to multiple answers

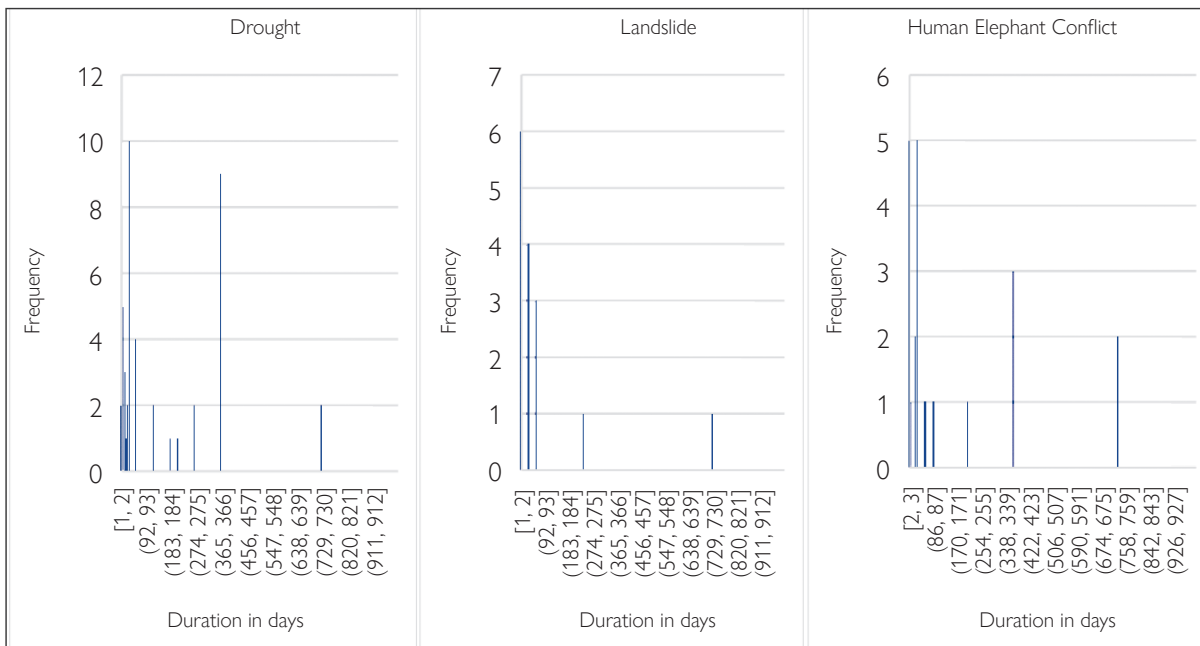
Source: Authors

Table 3 - 10: Duration of Temporary Migration

Characteristic	Obs.	Mean	Std. dev
Average duration of temporary migration (In days)	333	685.57	1117.73
Duration based on type of disaster			
Floods	10	41	113.85
Droughts	64	992.86	1357.57
Landslides	20	320.6	665.23
Human animal conflicts	23	358.43	798.47

Source: Authors

Figure 3 - 10: Distribution of Duration of Temporary Migration



Note: Distribution for floods is not included due to the small number of observations

Source: Authors

When considering the origins and destinations of temporary migrants, the majority had temporarily migrated from the origin areas like Anuradhapura (24 %), Hambantota (13%), Matara (11%) and Monaragala (8%) where droughts and sea level rise are highly prominent. As highlighted in a HH KII in Horowpathana, support for drought-affected communities relative to those exposed to sudden onset events is limited. This was noted as “if there is a flood or a landslide, people will receive some relief, but for drought-affected people there is no such thing”. Confirming this, most KIIs in drought-affected areas indicated that the support they received was Samurdhi, a common social safety net overseen by the government, which is not specific to their exposure to a climate disaster. Further, as noted in the Horowpathana FGD, some engaged in relief work called “Sahanadara” work. For that, you get a small allowance once a week, when you work for a few hours in the morning. Like cleaning the roads and likewise”. Moreover, it was highlighted that they “got about LKR 500 or LKR 700 per day. But it depended on the person and the type of work also.” There was a clear selection in terms of who sought that type of work/government support as opposed to finding employment as temporary migrant workers. As discussed during the FGD in Anuradhapura, “it is not the people who can work who went there. People who can work would work elsewhere and do something else.” As such, seeking alternative livelihood opportunities beyond agriculture is critical for such communities. Also, a considerable number of migrants have temporarily moved from the areas like Badulla (10%) and Nuwara-Eliya (7%) where incidents like landslides are highly prominent. Regarding destinations, most had temporarily moved to areas like Colombo (26%) and Gampaha (21%). Reflecting on the previously discussed economic reasons for migration, higher employment opportunities and income availability in these urban areas are likely to have contributed to the migration to these areas. Also, many migrants have temporarily moved to areas like Anuradhapura (9%) and Hambantota (8%). This may be attributed to drought, crop failures or unreliable harvests in the rural areas in Anuradhapura and Hambantota. People tend to move towards urban areas within the same districts in search of other income opportunities. As noted during the FGD in Anuradhapura, those internally migrating within the district are often employed in activities such as masonry. All qualitative data like KIIs, FGD and case studies highlighted the importance of networks in finding employment opportunities in the place of destination.



Photo 3- 3 : Sooriyawewa, Hambantota  
Source: Authors



Thanamalwila, Hambantota

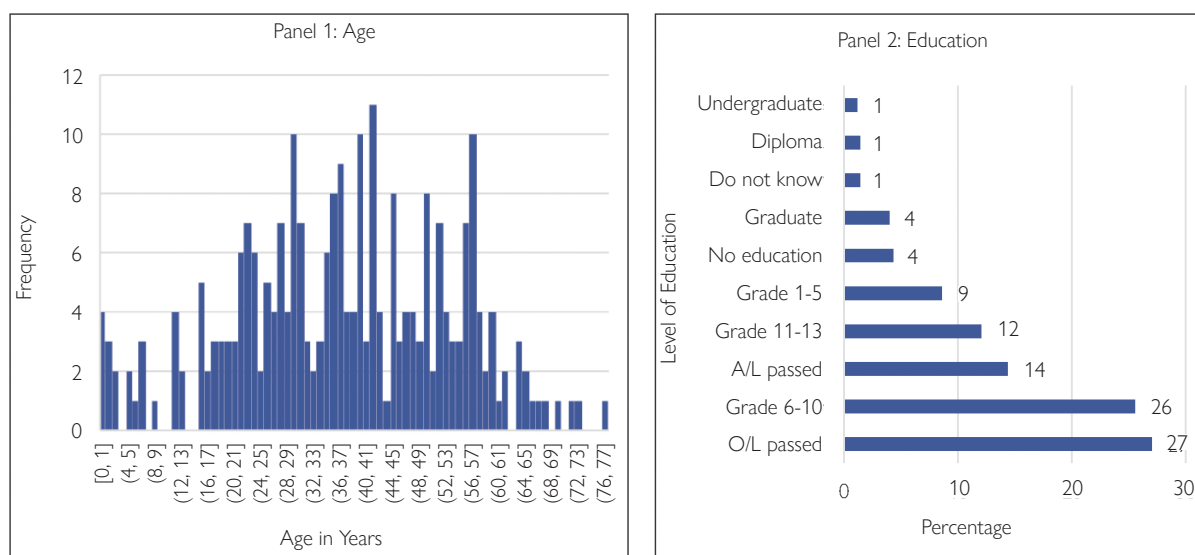
Among those who migrated to Colombo, most originated from Matara, while for Gampaha, the highest sending district was Anuradhapura. In the case of Anuradhapura and Hambantota, most temporary migrants have originated within the respective districts. Interestingly, these numbers are larger than the outflow of migrants to Colombo and Gampaha. This indicates that similar to migrating temporarily towards far away districts. There is a preference to migrate to relatively close by places, possibly due to the lower financial, social and opportunity cost of migration due to closer proximity to home. As reflected in qualitative data, temporary migrants find employment opportunities at the destination by harnessing their networks. A HH KII respondent from Thanamalwila noted that “the people who work as bricklayers [at destination areas] call and inform me to go on a specific day. Thereafter, five or six of us get together and go” for such temporary migrant jobs away from home. Moreover, the qualitative data underscored how temporary migrants tend to return to the same areas for employment repeatedly. See RQ4 for a case study of temporary migrant.

### 3.2.3 Seasonal Migration

Seasonal migrants can be identified as a subset of temporary migrants who combine activity at several places according to seasonal labour requirements (Keshri & Bhagat, 2010). Seasonal migrants considered here include seasonal migration due to agricultural as well as fisheries seasons. Similar to the previous types of migration discussed, the reasons behind seasonal migration also include external factors such as the nature of the climate event they are exposed to and the socio-economic factors in their place of origin and the destination they may decide to migrate to.

Similar to those identifying themselves as temporary migrants, its subset of seasonal migrants also has a larger share of males (64 %) among the 258 seasonal migrants. The average age of seasonal migrants is 37 years, while the age ranges from 0 to 77 with a standard deviation of 16 years. Similar to the temporary migrants, the age distribution of seasonal migrants also includes a clear left and right tail (see panel 1, Figure 3 - 11). However, unlike the very peaked age distribution of temporary migrant workers, the season migrants’ age distribution is nearly bell-shaped, with a large proportion in the working ages. As expected, most seasonal migrants are employed (64%). However, the education level of seasonal migrants is lower than that of temporary migrants. Specifically, the majority of seasonal migrants have an education of grade six to ten (41%) followed by grade 1-5 (29%) (see Figure 3 - 11).

Figure 3 - 11: Age and Level of Education and Employment Status of Seasonal Migrants



Source: Authors

Similar to the case of temporary migration, as well the exposure to climate events is far higher than the exposure itself being identified as a direct push factor for migration. Specifically, when 216 individuals were exposed to sea level rise/coastal erosion, only 25 identified that as a reason for seasonal migration. As such, reasons for seasonal migration also mirror temporary migration. This similarity is also seen in economic reasons identified as factors for migration. Here, a majority had identified economic reasons such as inadequate income from livelihood at the sources (190 individuals), greater job opportunities in destination (246 individuals), higher income in destination (181 individuals), unreliable harvest / lack of food security in origin (08 individuals) and crop failure at origin (07 individuals) as drivers of seasonal migration (see Table 3 - 12).

A peculiar aspect of seasonal fisheries migration is that it has been taking place for a long time due to the monsoon patterns across the East and West coasts of Sri Lanka. However, this long-standing seasonal migration of fishermen has been affected by climate change aspects not limiting to sea erosion, increase in salinity in inland waterways and temperature changes, affecting the intensity and regularity of seasonal migration. When such climate change aspects affect livelihoods and poverty in fishing areas leading to changes in the seasonal migration of individuals in these communities. For instance, sea erosion has challenged the practice of drying fish on the beach or rocks.

Thus, even though seasonality in migration is largely due to monsoon periods across the East and West coasts in Sri Lanka, the related push and pull factors for such seasonal fisheries migration are intensified due to dynamics in climate change. Specifically, as highlighted in qualitative data, the reasons behind income loss in areas of origin are magnified by sea erosion, the sea caving into the land and the unpredictability of storm seasons. A KII respondent from Karaitivu pointed out that "Before, there were no issues. We can bring all the fish caught to shore, whatever the amount. Now, with the fear of the stones on the shore, it is impossible to do so. It is difficult to get the entire catch trapped in the net freely to the shore." Similarly, one KII respondent originating from Puttalam and interviewed while serving as a seasonal migrant in Trincomalee elaborated on how his vegetable cultivation and entire investment for irrigation in Puttalam was destroyed by flooding and that this climate disaster prompted him to take up seasonal migration for fishing: "everything went under water. Couldn't even harvest... Then we sold all the stuff, including the pipes, motors and what not and repaid all the loans. After that, we saw that we need not do agriculture".

Table 3 - 11: Individual Level Exposure to Climate Events and Climate Events as Reasons for Seasonal Migration

Climate event	Number of individuals exposed to climate events	Number of individuals identifying climate events as the reason for migration
Floods	74	8
Drought	25	13
Landslide	2	9
Sea level rise/coastal erosion	216	25

Note: Total may not add to 258 due to multiple answers

Source: Authors

Table 3 - 12: Economic Reasons for Seasonal Migration

Economic Reason	Frequency
Not enough income from livelihood sources	190
Unreliable harvest/lack of food security	08
Crop failure	07
More job opportunity in destination	246
Higher income in destination	181

Source: Authors

Also, when considering the nature of migration as depicted in below Table 3 - 13, the majority (88.37%) had seasonally migrated due to fisheries seasons,<sup>16</sup> while 7.36 per cent had migrated due to employment reasons and 2.71 per cent had migrated due to crop seasons.

Table 3 - 13: Nature of Migration

Nature of Migration	Frequency	Percent
Employment seeking	19	7.36
Migration during crop seasons	07	2.71
Migration during fishing seasons	228	88.37
Not reported	04	1.55
Total	258	100.00

Source: Authors

In terms of the duration of seasonal migration, the average number of days during the seasonal migration is 76.87 days and the resulted standard deviation is 82.84. With regard to origin, the highest number of seasonal migrants in this sample were from Puttalam, Matara and Batticaloa, while the top three destinations were Trincomalee, Hambantota and Mullaitivu (See Table 3 - 14). Among all origin destination pairs, the Puttalam to Trincomalee was a well-established and prominent corridor, as reflected in both quantitative and qualitative data. As highlighted in qualitative data, this migration across two fishing areas across the West and the East coasts is driven by the seasonality in ocean conditions for fishing across the two regions. The recruitment process for these seasonal migratory fishermen involves a well-established mechanism where a sort of agent of the fishing hut owner/employer in Trincomalee scouts seasonal migrant fishermen from Puttalam. As noted in KII's conducted in Trincomalee, such agent scouting for the fishing hut owner/employer was a woman. Subsequently, the owner/employer of the fishing huts will provide a salary advance and transportation for the recruited seasonal migrant fishermen to take up employment in Trincomalee. This salary advance is deducted from seasonal migratory fishermen's monthly wages. Such a seasonal migrant worker normally "do about 6 months here and then go back".

<sup>16</sup> This may be due to locations focused

Table 3 - 14: Origins and Destinations of Seasonal Migration

Destination	Ampara	Badulla	Batticaloa	Gampaha	Hambantota	Matara	Monaragala	Nuwareliya	Puttalam	Trincomalee	Total
Ampara	1										1
Batticaloa	1										1
Colombo			1					2			3
Gampaha		1									1
Hambantota					1	37					38
Jaffna									1		1
Matara					4						4
Monaragala							7				7
Mullaitivu									35		35
Negombo											1
Puttalam											8
Trincomalee			21	2					132	2	157
Total	2	1	22	2	5	37	7	2	177	2	257

Source: Authors



Photo 3-4 : Mundalama, Puttalam

Source: Authors



When the origins and destinations of seasonal migrants are considered, a majority had migrated from the origin areas affected by droughts and sea level rise, while destination areas are those with well-established seasonal migration networks.

Below is a case study of a temporary and seasonal migratory fisherman in Kuchchaweli, Trincomalee.



Mr. Arumainathan Kunaraj' story

Mr. Kunaraj is a migratory fisherman from the Vagarai Division of Batticaloa District in the Eastern Province of Sri Lanka. Normally in his village, most people engage in farming or fishing (both inland and coastal fishing) or migrate to areas like Puttalam or Trincomalee for fishing.

Mr. Kunaraj is 40 years old now and the father of two children: an elder daughter (22 years) and a younger son (19 years). His daughter is currently pursuing higher studies at a Teaching College. His son is already married and engaged in fishing as a livelihood. His wife has already migrated to Riyadh, Saudi Arabia as a domestic worker to support their daughter's education and to settle loans. Kunaraj also owns a small plot of land near his home, which is used to cultivate vegetables for their family's consumption.

Generally, in his area in Batticaloa, both inland fishing and coastal fishing are practiced. But Mr. Kunaraj's family cannot afford fishing equipment like fishing gear and fishing nets and so on, due to high cost. He noted that "we don't have the ability to do fishing in our area. For fishing in the river, we need LKR. 10,000 to buy essential things like fishing nets and fishing gears. Yet when involved in inland fishing, it is not guaranteed that we can get a daily income". As such, Mr. Kunaraj annually migrates to Kuchchaweli, Trincomalee as a seasonal migratory fisherman. In contrast to involving in fishing at his origin, upon migrating to Kuchchaweli, he is guaranteed a consistent daily income. When working for a businessman operating fishing huts for migrants, the workers are assured that they receive a "daily payment if they go fishing or not". This guarantee's stream of income is critical for Mr. Kunaraj's survival. It ensures that he can settle his loan, save a little amount and "have my meals from the employer" and his "wife and family members also can have their meals on time".

Normally during February each year, he comes to the Kuchchaweli area in Trincomalee, for fishing and returns back in November. Mr. Kunaraj's father has previously worked for this employer and now has worked in this job for about 15 years. Therefore, he has a very close, long-standing and loyal relationship built up over the years with his employer. While at the destination, the employer provides Mr. Kunaraj with all essentials, including drinking water, sanitation facilities and 3 meals per day. As he stated, "when we arrive here, the first 10 days we can't go to the sea because there will be heavy wind. So, during that time we do minor activities here like build huts". During the time of season migration in Kuchchaweli from February to November, if needed, the employer provides leave for season migrants to return to their origin for a few days once a month. Mr. Kunaraj normally goes home in April for the new year vacation and stays for 5 days during vacation.

While in Kuchchaweli, Mr. Kunaraj lives in a temporary shed/hut near the sea, built by the workers on instructions from the employer. As he stated, "my owner's house is opposite to us, so we have electricity through the wires from the boss' house". In his fishing huts compound, there is a separate shed for sleeping, where around 20 people sleep at night. There are no beds in that shed, but the fishermen have levelled the land and placed mats for sleeping. Additionally, there is a separate shed for cooking purposes. Along with the fishermen, a man and woman from Puttalam have seasonally migrated to do cooking for the fishermen. "They prepare 3 meals for us. They don't do the fishery works". The two of them, with their child live in the cooking shed.

For these migratory fishermen, normally the employer covers the basic health expenses. If one of them gets ill, their employer will take them to the hospital and pay for all necessary expenses, including medicine and bus fare. As he mentioned, "the 'Thiriyai' government hospital is also near". In addition to basic health care, this employer also has facilitated vaccination for COVID-19; the employer has arranged a van for these seasonal migrants to go to Thiriyai hospital for the first and second doses. Mr. Kunaraj noted that he had received the third dose of the vaccine while in his village. He further highlighted, "if my children have health issues, my boss will surely help us". Regarding transportation to get about when in Kuchchaweli, they go to the junction and board a bus. For that, at the Kuchchaweli junction, they get a bus to Trincomalee bus stand and from there, they can get a bus to their village". Typically, the employer provides bus fare for these seasonal migrants.



At the time of speaking, Mr. Kunaraj received a daily wage of LKR 1000 per day. He did not seem to be satisfied with this wage rate. For instance, he mentioned, "...due to the country's economic crisis, our boss and we also face problems for everything. All product prices too have increased. But our daily wage is LKR 1000 and that has not changed yet". About remitting his salary, initially, he had transferred the money to one lady in his village - who scouted fishermen from Puttalam for seasonal work in Kuchchaweli for his employer. Then that lady used to give money to his family. As he stated, "Our salary will send to her bank account and she will distribute the money to my family". But now Mr. Kunaraj transfers his salary directly to his daughter's bank account.

Mr. Kunaraj has saved his earnings as much as possible to settle his loans and family obligations. According to him, "I came here to achieve my goals. I don't use any drugs or alcohol. So, I save my money and use it efficiently. So, I settled my loans, bought a new piece of land and built a fence".

From November to January every year (where seasonal migration for fishing is not happening), Mr. Kunaraj temporarily migrates to Colombo for construction work. At the time of speaking, he received a monthly salary of LKR 35000 there and LKR 500 per day for three meals. Unlike in Kuchchaweli, in his migratory setting in Colombo, the migrants have to prepare meals on their own. Similar to seasonal migration for fishing, for temporary migration also, the construction site owner/employer arranges all other essentials like a temporary shed for sleeping, water, sanitation, electricity and other facilities. However, Mr. Kunaraj is not so satisfied with life on the construction sites in Colombo. Rather, he prefers life in Kuchchaweli, as a fisherman. As he stated, "I am more satisfied here [Kuchchaweli]." He highlighted that "being in Colombo is difficult". Some of the reasons provided by Mr. Kunaraj to justify his position included when "I work in Colombo, I only get 30 days salary, but I worked for 45 days." Similarly, unlike in Trincomalee, when in Colombo, he had to bear transport costs to and from his village, so the transport cost in terms of Trincomalee is less. Additionally, during the COVID-19 pandemic there were issues due to social distancing and lockdowns. Apart from these, in Kuchchaweli, he is guaranteed a daily wage and 3 meals while working for a trusted employer.

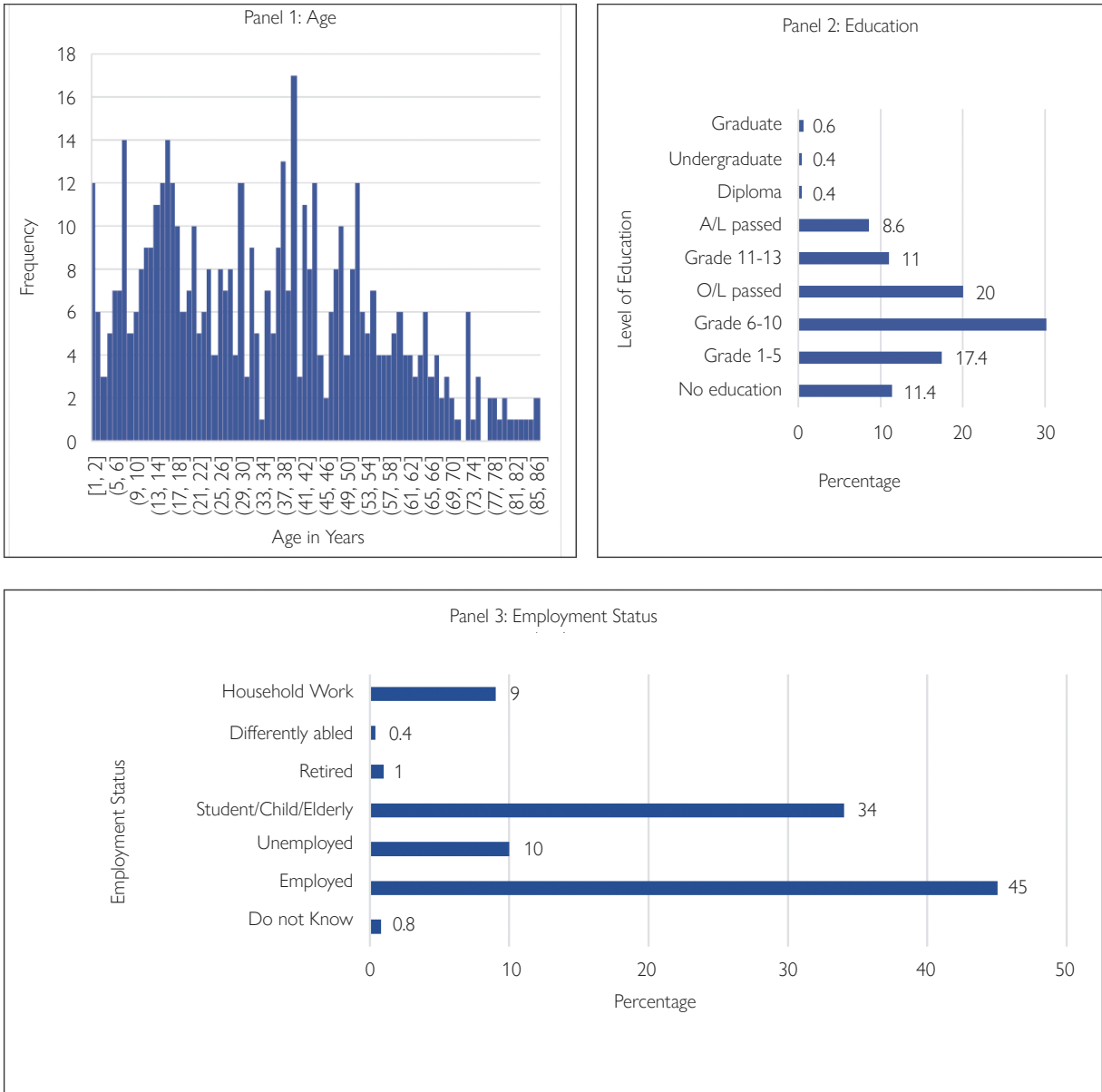
### 3.2.4 Permanent Migration

Permanent migration or relocation can be identified as people move or are assisted to move permanently away from areas of environmental risk (Rigaud, et al., 2018). According to Ferris, (2020) there are several different sub-categories of people who may need to be relocated as a result of the effects of climate change, including: 1) People who need to be relocated from areas prone to sudden-onset natural disasters which are increasing in severity and intensity as a result of climate change (such as flood or landslides areas); 2) People who need to be relocated because their livelihoods are threatened by slow-onsets effects of climate change and extreme weather events (such as salinization of water resulting from sea level rise and increasing drought frequency); 3) People who need to be relocated because their lands are needed for protective measures or adaptation projects (such as water reservoirs); and 4) People who need to be relocated because their country or parts of their country could become unsuitable for habitation or supporting livelihoods related to the negative effects of climate change.

The incidence of permanent migration, resettlement and relocation due to rapid onset disasters (namely landslides, floods) is more prominent in Sri Lankan context (Ministry of Disaster Management, 2016), which is evident from this study. For instance, this study shows 500 individuals have permanently migrated/relocated/resettled. Among them, 53 per cent are females, while 47 per cent are males. The age range of these permanent migrants is 1 to 86 years, while the average age was 34 years with a standard deviation of 20 years (see Panel 1, Figure 3 - 12). Similar to displacement, the age distribution of permanent migrants also indicates two humps with a concentration of permanent migrants in the ages of 20-50 years. Among these permanent migrants, 45 per cent are employed while 30 per cent are educated in grades 6-10, while 20 per cent have passed O/L (see panel 2, Figure 3 - 12). The distribution of age and gender among permanent migrants does not indicate selectivity. This is similar to displacement and in contrast to the patterns observed in seasonal and temporary migrants discussed before. This is mainly due to temporary migration/relocation often involving entire HHs without any possibility for selection within HHs as to who migrates. Approximately 50 per cent of the permanent migrants are employed, while the second highest representation (35%) comes from the student/child/elderly category. Almost similar representation of unemployed individuals and those engaged in HH work can be noticed (9-10%). This is in contrast to the comparatively low representation of those engaged in HH work and

the representation of the student/child/elderly category seen under seasonal and temporary migration. This indicates that permanent migration too is less selective and not done encompassing individuals with the potential to engage in economic activity.

Figure 3 - 12: Age and Level of Education and Employment Status of Permanent Migrants



Source: Authors

The exposure to climate events and reasons for permanent migration are presented in Table 3 - 15. Unlike in the case of temporary and seasonal migration, a clear correlation is seen between exposure to climate events and them being reasons for permanent migration. For example, 227 individuals out of 500 permanent migrants in this sample were exposed to flooding, 224 identified flooding as the reasons for their permanent migration. Similarly, when 251 were exposed to landslide, 249 identified the same as the reason for their permanent migration. This indicates that victims clearly identify the sudden onset events such as floods and landslides as reasons for their migration. In other words, permanent migration is identified as a response to sudden onset climate hazards. Concurrently, such clear identification was not possible for temporary or seasonal migration, often promoted by sea level rise and drought.

Table 3 - 15: Individual Level Exposure to Climate Events and Climate Events as Reasons for Permanent Migration

Climate event	Number of individuals exposed to climate events	Number of individuals identifying climate events as the reason for migration
Floods	227	224
Drought	21	16
Landslide	251	249
Sea level rise/coastal erosion	5	0

*Note: Total may not add to 500 due to multiple answers*

*Source: Authors*

At the same time, contrary to the case of temporary or seasonal migration, the significance of economic reasons is very low for permanent migration. For instance, reasons such as not enough income at the origin were identified by only 6 per cent, while unreliable harvest/lack of food security was a reason for only 3 per cent. Similarly, conditions in the destination were also identified by only very a few respondents. Nevertheless, new livelihood issues in the destination due to relocation were often highlighted in qualitative data. For instance, discussants at the Aranayake FGD highlighted how they had plantations and other agriculture-related livelihoods in the origin. Some commonly identified plantation crops include tea and spices such as cloves. Plantation landowners of this kind were severely affected as they could not continue their cultivation livelihoods. This was mainly due to the distance between the new location and the origin, as well as the plantations being destroyed by climate events. Similarly, those relocated to a high-rise building in Henemulla due to floods also highlighted different nuances relating to the issue. For instance, a HH KII in Henemulla has grown many vegetables such as tomatoes, brinjals, chilies, ladies fingers and pumpkins for HH consumption. However, as highlighted by these HHs, “here [place of relocation], we have nothing to grow. We cannot even grow anything in a pot here. When we water, if it gets stuck under the pipe, we are in trouble again”. Such non-transferability of agricultural livelihoods from origin to destination resulted in low HH income and many economic difficulties among relocated respondents.



*Photo 3- 5 : Relocation Site in Aranayake, Kegalle*

*Source: Authors*



Photo 3- 6: Relocation Site in Henemulla Flats, Colombo  
Source: Authors

Moreover, the role played by the government in permanent relocation is evident in the data. For instance, 36 per cent of the respondents in this sample indicated that incentives provided by the government acted as a reason for permanent migration, while the government has forced 35 per cent of them to move (see Table 3 - 16). Highlighting nuances of such forceful relocation, a HH KII in Aranayake related how a geologist mistakenly declared land as being within the danger zone of landslides, resulting in the inhabitants having to relocate. As narrated by the KII respondent, the geologist has said “your side will not have a landslide, but now I have given the recommendation so, now there is nothing to do, you have to leave”. The process for such forceful relocation involves initially disconnecting the power supply and compelling residents to vacate the place. However, as seen in qualitative data, some individuals stayed even after the electricity was disconnected, even if the house is in a high-risk area. Similar issues in the relocation process were highlighted by those relocated to a high-rise building in Henemulla in Gampaha due to floods. For instance, as noted by the respondents to a HH KII in Henemulla, after the flood water had receded, this family had started cleaning and repairing their home prior to their return and as narrated by her, “when we’re making it halfway, we were asked to stop since we will have to move”. Subsequently, a series of activities took place where officials came to the flooded home and checked how many people lived, measured the houses and “took pictures of me [respondent] in front of the house”. Next, these respondents were required to prove their residency in the location for the past five years, which they had done by providing information on voting lists and children’s birth certificates. A few days after giving those documents, they were told to get ready to relocate, at which point this family had packed all their belongings in anticipation of relocating to the new home. But “we got ready with all our stuff and waited but they never came”. Finally, this family was relocated only about 2 years after the officials’ initial visit. The actual move from the origin to the new home had been further stressful; officials suddenly came and asked them to leave within 10 days. As this move was during floods, the family refused to relocate without an opportunity to first clean the new place and their belongings affected by floods. Subsequently, officials complied to this request. Despite the period of 2 years, their actual move was so rushed that they “did not even get to check an auspicious time” to move into the new home.

Table 3 - 16: Other Reasons for Permanent Migration

Push/Pull factors behind mobility	Frequency	Percent
Not enough income from livelihood sources	31	6.20
Unreliable harvest/lack of food security	17	3.40
Crop failure	03	0.60
Job opportunity in destination	18	3.60
Higher income in destination	04	0.80
Government provided incentive to leave due to development project	180	36.00
Government forced to move	176	35.20

Source: Authors

At the time of data collection, the permanent migrants in this sample have, on average, spent 1105 days with a standard deviation of 889 days at their place of permanent migration. However, there is a wide variation in this duration by the climate event experienced. For instance, the duration at a new location due to permanent migration when exposed to landslides is the longest, with 1779 days (which is close to five years), while the duration in the new location associated with floods is 335 days (see Table 3 - 17). As revealed during preparatory work for sampling and in KIs, FGDs and case studies, the landslides have a relatively better-established relocation process. Within landslides, Kegalle also seemed to have a better mechanism in place than Ratnapura. Due to the locations focused on this study, the landslide victims are likely to have been relocated more systematically, much earlier than the other climate events considered here.

Table 3 - 17: Duration of Permanent Migration

Characteristic	Obs.	Mean	Std. dev
Average duration of permanent migration (In days)	496	104.793	889.3089
Duration based on the type of disaster			
Floods	224	335.346	438.9749
Droughts	16	1190.375	1384.552
Landslides	245	1778.816	481.7614
Salinity/sea erosion/sea level rise	0		

Source: Authors

With respect to support received during the period of permanent migration or resettlement, out of 500 permanent migrants, 436 individuals had received some type of assistance, as depicted in below Table 3 - 18. Specifically, 400 individuals had received support to find land/housing/shelter for relocation. As elaborated in qualitative data for those relocated in Aranayake, the government provided a plot of land and funds for building a new house. These funds were disbursed in instalments based on reaching pre-defined milestones. For instance, disbursement when laying the foundation, raising walls and building the roof. As highlighted during the FGD held in Aranayake, rare cases lacked the capacity to manage funds to reach these pre-defined milestones. This resulted in excessive delays in completing the new house construction in the relocated area regarding the conditions in the destination. Here, 54 individuals stated as they had access to safe drinking water, 55 individuals stated as they had access to food and 42 individuals stated as they had access to sanitation in new location. However, very few individuals (9) were supported to find livelihood options in the new location. Among the entities providing support for permanent migrants, 409 individuals had received support from the government, while 285 individuals had received support from the private sector, 202 had received support from non-government organizations and 196 had received support from civil society organizations. In addition, 13 individuals had received support from other types of organizations. Similar to the case of displacement, in areas of permanent resettlement, the migrants have also established welfare societies to help the community. One such example revealed during the FGD, is the “*Maranadhara samithiya*” established by those relocated from the Saamasara kanda area to Aranayake. This welfare society assists relocated families to coop in a situation of a family member’s death while at the new location.

Table 3 - 18: Type of Support Received and the Organizations Providing Support for Permanent Migration, in Most Recent Migration Round

Type of Support	Number	Percent
Access to safe drinking water in new location	54	10.80
Access to food in new location	55	11.00
Access to sanitation in new location	42	8.40
Providing land/housing/shelter	400	80.00
Support to find livelihood options	09	1.80
Type of Organization Providing Support		
Government	409	81.80
Private sector	285	57.00
Civil Society Organizations	196	39.20
Non-government organizations	202	40.40
Other	13	2.60

Source: Authors



When considering the origins and destinations of permanent migrants, the majority had migrated from the origin areas like Kegalle (46.00%), Gampaha (39.60%) and Nuwara-Eliya (3.20%). These are where sudden onset events like landslides and floods are highly prominent. In terms of destinations, the majority had permanently moved to areas like Kegalle (46.18%), Colombo (38.35%) and Gampaha (7.03%). This may be due to the resettlement schemes implemented by the government in areas like Kegalle, Colombo and Gampaha due to the high risk of landslides and floods. However, relocation or permanent migration is a difficult decision and is often made as a last resort. Among these identified for relocation, some are willing to move while others are not. In the case of the flood prone area in Bulathsinghala, as revealed during the FGD, “our roof was also underwater. We do not need a single rice packet, not even a pin we need. We just ask for 10 perches somewhere. We can keep that and at least eat salt and rice”.

Below is the case study of a HH relocated in Aranayake, Kegalle area due to landslides.

#### Case Study: Permanent migrant

##### Mrs. Sitha Malsinghe from Aranayake

Mrs. Sitha Malsinghe is from the Thalgamuwa GN division in the Aranayake division of the Kegalle district in the Sabaragamuwa Province of Sri Lanka. This area falls under the wet zone of Sri Lanka, where the main livelihood of many people is the cultivation of crops like tea, pepper, cinnamon, coffee and areca nut.

Ms. Sitha Malsinghe is a 56-year-old mother of four children - 3 daughters and one son. The oldest and second daughters are both married. The third one is a son who works on a bus. Her younger daughter works in a garment factory in Katunayake. Ms. Sitha Malsinghe currently lives with her son. Mrs. Malsinghe and her family were relocated in 2018 to the Thalgamuwa area due to a huge landslide in 2016 in Saamasara kanda, Aranayake division. She had lived in Saamasara kanda area for about 23 years until the landslide occurred in 2016. Mrs. Malsinghe had tea, areca nut, coffee and pepper cultivated as their main source of income. Apart from that, she runs a tailoring business.

When the landslide occurred in 2016, Mrs. Malsinghe and her youngest daughter were at home. Before the incident, Mrs. Malsinghe noticed a few signs of the landslide. She could identify these signs as she had previously seen a landslide in Nuwara Eliya. As noted by Mrs. Malsinghe, when she was at a close by house at “around 12.00 noon, there was some water leaking from the walls, so I was going to put some cement and cover it. When I came out, there were some areca nut trees around the house and those trees were touching our roof almost. Then suddenly the water was coming over the walls also and was up to my knee”. Since the GN office had previously told her not to stay at her house when it rained and had instructed her to go to another place, Seetha immediately informed the GN officer about these signs of a landslide. When she informed her neighbours and relatives, they all dismissed her warnings. As she recalled, “but then some of them said that it would not happen. ... They even said that I was crazy. So, I told my brother’s family and they also told me I am crazy.” At around 5.15 pm on the same day, the landslide occurred. According to Mrs. Malsinghe, her daughter and son were already aware of the possible landslide and had evacuated. They spared the disaster. However, most of the neighbors, her brother’s family and her mother perished due to the landslide. As she stated “we saw on top of the mountain a kind of smoke. Then we heard a loud sound of rocks”. At this point, Sitha had started running with her daughter and was screaming to the people at the house located below theirs about the oncoming landslide and asking to run. She realised “I don’t know how I ran in the correct direction; God surely sent me to that side. Then when I was running, there was a big lake and you could not cross it. The landslide happened at 5.15 p.m. Then I held my daughter’s hand and thought it was fine even if I died and stayed on top of a rock...”

After the landslide in 2016, Mrs. Malsinghe, her daughter and her son stayed in a displacement camp for about 8 months. During the period of displacement, she continued her tailoring business with her sewing machine, went to her tea estate and earned money. As she mentioned “I kept it [sewing machine] in front of the tent and continued sewing”. Then one day, officials from the Red Cross society came for inspections and took photos of me sewing and the clothes I stitched. That had made Sitha very happy to be recognized in her community. With this, many people in the camp, especially the little girls, helped her start making carpets using the remnant cloth pieces. She rewarded such support with dresses she stitched. These activities helped her to rebuild herself during this painful experience. After the Red Cross inspection and evaluation,

they granted Mrs. Malsinghe LKR 55,000 to buy a sewing machine. Apart from such livelihood support, those in her displacement camp were provided with all the necessary essentials like food, gas, cooking utensils, electric items (touch, light bulbs) and dry ration by several non-governmental organizations (NGOs), civil society organizations (CSOs) and private sector organizations. Also, one private sector organization offered a monthly scholarship worth LKR 5000 for her daughter's education.

After 8 months at the displacement camp, Mrs. Malsinghe family rented a house and stayed there for a few months. After her daughter completed her exams, they went to a temporary shelter made in her tea estate. Her son-in-law helped her to make that place temporarily. While they were in that house, they started to build the house in the government relocation scheme in the Thalgamuwa area, with the money provided by the government. As she mentioned, "Initially LKR 3 lakhs were given to build the foundation. When the walls have been half completed, the balance money was approved". Mrs. Malsinghe worked hard in building the house and only took a 'bass' (skilled construction worker). She got her son-in-law to help her with constructing the upper parts of the house. With such personal commitment and family labour, Mrs. Malsinghe was able to build her new house within a strict budget of LKR 14 lakhs without running into any debt. Mrs. Malsinghe's family shifted to the new location in 2018.

In the new location, Sitha continues her tailoring business but highlighted that her total income has declined as she has to rely only on her clothing business. On the contrary, before the landslide, while they were in Saamasara kanda, she was able to earn much more as her tea, pepper, coffee and areca nut plantations also brought in money. As such, compared to her monthly income of LKR 300,000 earned in her previous location, now she could earn only around LKR 100,000 per month in the new location. Similarly, her expenditure at the new location is much higher than in the previous location. She elaborated these as "there [in the previous location] the water and gas bills were minimal since we had firewood. When we were there, we did not bring biscuits to drink tea. No bus costs. Now to go from here to Dalugama, the bus charges are also high, so it is really hard to live here [in the new location]."

At the community level, since their entire village was relocated, they have very close social and community ties with a strong network among those relocated. However, there have been conflicts between those who were already in the location and the newcomers. However, these issues have been resolved to some extent over time and now several welfare societies have made life easier for those relocated.

### 3.2.5 Determinants of Type of Mobility

The migration decisions of individuals and HHs were assessed under three discrete choices: displacement, seasonal migration and permanent migration, using a multinomial logit model. Hence, the dependent variable consisted of three levels representing the three mobility choices. The regressors covered the demographic, social, economic and climate change-associated dimensions to assess their influence on the migration decisions made by individuals and HHs. Average marginal effects were estimated to assess the covariant changes of multinomial estimations concerning the base categories of both models.

Table 3 - 19 exhibits the results of the multinomial logit model estimated concerning the individuals. The model was significant under the 1 per cent significant level, examining sound goodness of fit. The results are discussed in the following sections under the three migration categories assessed by the model.

#### *Individual Level*

##### *Seasonal Migration*

Seasonal migration is the periodic movement of an individual or population from one location or climate to another according to the annual cycle of weather and temperature fluctuations. However, such patterns have been significantly altered as per the literature (De Silva, Weatherhead, Knox and Rodriguez-Diaz, 2007; De Costa, 2008; Eriyagama, Smakhtin, Chandrapala and Fernando, 2010; Mattssona, Ostwalda, Wallinc and Nissanka, 2015; Basnayake, et al., 2007; Sathischandra, Marambe and Punyawardena, 2014; Premalal, 2009; Premalal and Punyawardena, , 2013). Hence, it is crucial to assess the climate change-induced weather and temperature alterations on an individual's migration decisions. According to the findings of the model, ten regressors were statistically significant. These plummeted across all dimensions under consideration. In terms of the demographic characteristics of the person, the findings indicate



that married individuals are more likely to embark on seasonal migration. However, neither the remaining marital statuses nor the demographic factors were statistically significant. Nonetheless, the coefficients' signs revealed that older age and female gender had a negative effect on seasonal migration. Among the HH characteristics considered, ownership of HH buildings and machinery/equipment like HH assets was revealed to be negative drivers for seasonal migration among individuals. For example, a person's propensity to migrate seasonally diminishes, if he or she owns a home or other buildings or machines. In addition, agricultural activities were discovered to have both positive and negative outcomes, depending on the landowner and the kind of agricultural activity. According to the findings, the chances of seasonal migration decrease if a person owns agricultural land. When paddy or crop production is an agricultural activity, the tendency grows. Individuals who participated in marine fishing had a similar propensity for seasonal migration. However, persons involved in animal husbandry had a decreased tendency to move seasonally. The climate change-induced influence on seasonal migration decisions by individuals was prominent for sea level rise. It was evident from the analysis that the sea level rise or associated saltwater intrusion acts as a positive driver for individuals to migrate.

#### *Permanent Migration*

Permanent migration is the movement of people from one geographical region to another, regarded as a settlement. In contrast to seasonal migration, an individual's inability to care for themselves is crucial to their choice to migrate permanently. Individuals with the inability to care for themselves had a greater predisposition to migrate permanently, according to the findings. The ownership of a house was also revealed to be a favorable factor in permanent migration. If a person owns their residence, their propensity to relocate permanently rises. Regarding farming, paddy and crop cultivating, individuals likewise showed a favourable tendency to move permanently.

In addition, persons working or retired, as opposed to those unemployed or students, were more likely to select permanent migration. Self-employed persons were also shown to be highly likely to choose permanent migration. However, government and private sector employees had a lower inclination. Similarly, if a person works as skilled, semi-skilled, or unskilled labour or in the farming, fishery, or forestry sectors, their likelihood to migrate permanently decreases. In addition to these characteristics, HH assets had a considerable effect. Consequently, ownership of lands, crop cultivations, vehicles, machinery, plants, or equipment serve as a deterrent to permanent migration. Climate-related occurrences also greatly influenced the choice of people to migrate permanently. The findings demonstrated that folding and droughts operate as persistent upward migration drives.

#### *Displacement*

During a state of emergency, climate change-induced abrupt onset occurrences cause temporary displacements. The model's findings indicate that married individuals are less likely to experience displacement. However, divorced individuals had great potential. Regarding cultivations, paddy and crop farmers had a lower predisposition for displacement. Likewise, persons who participate in marine fishing resisted temporary relocation. In addition, employment position was discovered as a major determinant. In general, employed persons demonstrated a negative disposition, but government personnel did not. In contrast to earlier scenarios, the climate change factors resulted in temporary population relocation in the opposite direction. Thus, droughts and sea-level-rise factors strongly and negatively influence the propensity of individuals to relocate temporarily.

Table 3 - 19: Individual's Mobility Choice: Results of The Multinomial Logit Model

Variable Name	Seasonal migration	p/z	Permanent migration	p/z	Displacement (dy/dx)	p/z
Age (years)	-0.007	0.649	0.010	0.510	-2.350E-05	0.957
Gender (female)	-0.048	0.907	0.016	0.966	0.001	0.945
Married	1.275**	0.034	0.545	0.364	-0.039**	0.026
Divorced	-11.598	0.997	-14.642	0.998	0.051***	0.000
Separated	1.679	0.197	-14.796	0.995	-0.025	0.560
Widowed	1.883	0.105	-13.564	0.991	-0.033	0.416
Marital status (Other)	-12.422	0.998	-12.701	0.999	0.051***	0.000
Number of own children	-0.196	0.273	-0.161	0.277	0.008	0.132
Up to GCE O/L	-0.672	0.176	0.545	0.416	0.008	0.624
Passed GCE O/Ls	-0.701	0.201	0.205	0.780	0.015	0.409
Passed GCE A/Ls	-0.480	0.569	1.126	0.176	-0.011	0.706
Above GCE A/Ls	0.897	0.473	1.200	0.359	-0.055	0.349
Education other	4.089	1.000	0.171	1.000	-0.254	1.000
No disability	1.089	0.760	2.184	0.200	-0.066	0.457
Difficulty seeing	-1.577	0.639	2.092	0.164	-0.003	0.974
Difficulty hearing	5.048	0.135	-15.513	0.983	0.174	0.990
Difficulty walking	-0.057	0.987	2.382*	0.087	-0.043	0.605
Cognition	-10.584	0.996	1.593	0.658	0.215	0.996
Difficulty with selfcare	-18.886	1.000	4.915***	0.009	0.345	1.000
Difficulty with communication	-14.766	0.998	-11.540	0.994	0.558	0.996
Ownership of residence (Owned)	-1.784	0.144	1.253**	0.045	0.018	0.564
Farming	0.236	0.766	0.052	0.961	-0.006	0.816
Ownership of cultivated land	-3.483***	0.000	-1.189	0.351	N/A	N/A
Total farming area (ha)	-0.024	0.947	-0.026	0.928	0.001	0.919
Paddy	1.997***	0.006	1.875***	0.001	-0.081***	0.000
Crops	3.316***	0.001	4.049**	0.018	-0.153***	0.000
Animal Husbandry	-2.532***	0.002	-1.837	0.142	0.093***	0.002
Inland fishing	0.149	0.830	-14.408	0.991	0.266	0.991
Marine fishing	2.385***	0.001	0.268	0.862	-0.060*	0.076
Employed	0.015	0.995	4.348***	0.003	-0.196*	0.091
Unemployed	0.323	0.809	-0.264	0.757	-0.005	0.860
Student/Child/Elderly	0.599	0.645	-0.171	0.823	-0.013	0.655
Retired	-10.248	0.995	5.612***	0.004	-0.284	0.106
Differently abled	-9.403	0.997	0.543	0.808	0.039	0.722
HH work	1.947	0.265	-0.428	0.748	-0.058	0.360
Farming fishing forestry	2.182	0.313	-3.382**	0.020	0.075	0.495
Government sector	-13.430	0.984	-3.486**	0.021	0.172**	0.040
Private sector	2.215	0.312	-4.265***	0.007	0.083	0.452
Skilled/Semi-skilled/unskilled labour	0.268	0.907	-3.944***	0.007	0.143	0.122
Self Employed	0.770	0.733	-5.096***	0.004	0.139	0.147
Employment (Other)	-11.890	0.994	-1.366	0.379	0.105	0.249
Average total monthly income	0.000	0.595	0.000	0.104	2.440E-07	0.218
HH asset - lands	0.770	0.101	-0.986**	0.038	0.001	0.964
HH asset – crops/plantations	-0.046	0.956	-4.165**	0.036	0.079*	0.070

HH asset -Buildings	-0.950**	0.014	0.619	0.125	0.010	0.378
HH asset – vehicles	-0.070	0.844	0.965***	0.012	-0.016	0.144
HH asset – machineries/tools/equipment	-1.649***	0.000	-1.636**	0.029	0.069***	0.000
Floods	-0.105	0.773	0.462	0.458	-0.006	0.671
Droughts	0.837	0.154	2.398***	0.001	-0.064***	0.001
Landslides	-0.331	0.730	2.207***	0.005	-0.034	0.216
Salinity/sea water intrusion	3.285***	0.000	0.322	0.687	-0.082***	0.001
Intercept coefficient	-7.882**	0.047	-7.765***	0.000	N/A	N/A

Note: \*-Significant at 10%, \*\*-Significant at 5%, \*\*\*Significant at 1%

Source: Authors' estimations using primary data

#### Household Level

In many studies on migration, HHs are used as the unit of empirical investigation. The HH has been defined as a social group that resides in the same place, eats the same meals and makes joint or coordinated resource allocation and income pooling decisions (Meillassoux, 1981). According to the farm HH economic model, a HH is a single decision-making unit that seeks to maximise its welfare given a range of revenue earning possibilities and a set of resource limitations (Hymer & Resnick, 1969; Ellis, 1993). Hence, a HH level analysis was conducted to capture the HH level decision making regarding the climate change-influenced migration in Sri Lanka.

Table 3 - 20 exhibits the results of the multinomial logit model estimated to assess the factors influencing a HH's collective decision on migration. HHs' seasonal and temporary migration decisions are influenced by numerous significant factors, while permanent migration is only influenced by whether or not the HH is engaged in farming. The marital status of the HHH influences seasonal migration decisions. Results revealed that HH with married, separated and widowed HHHs are more likely to migrate seasonally. Apart from that, the number of children in a family is also identified as a crucial factor in migration decisions. As per the results, when the number of children increases, the tendency for that H to make a collective decision on seasonal migration diminishes. Similarly, when the HH has an abundance of cultivated lands, the tendency to migrate seasonally significantly declines. Nevertheless, HHHs are more likely to migrate seasonally if they are engaged in farming, fishing, or forestry industries. However, if the HHH is engaged in animal husbandry, the HH's propensity to migrate seasonally declines. Unlike individuals, HH's average monthly income was a significant positive influencer for seasonal migration. The only climate change-induced variable identified as influencing seasonal migration is sea level rise. When sea level rise and associated saltwater intrusion rises, HHs are more likely to migrate seasonally.

As far as displacement is concerned, the number of children is a significant influencer. When the number of children increases, HH's tendency for displacement also increases. The HHH's educational level was also a significant factor, wherein the HHH who passed G.C.E A/Ls exhibited a higher tendency. As in seasonal migration, the tendency to be temporarily displaced declines when the total farmed area increases. The HH with crop cultivation seemingly exhibited less propensity. Nevertheless, when the average income increases, the tendency for them to be temporarily displaced increases. However, despite only a few variables have returned statistically significant in this model and these are considered under the assumption of *ceteris paribus*; displacement risk is influenced by a multitude of inter-dependent variables, all of which simultaneously affect exposure to hazard, vulnerability and resilience, which are which cannot be easily isolated with observational data.

Table 3 - 20: Household Migration Choices: Results of the Multinomial Logit Model

Variable Name	Seasonal migration	p/z	Permanent migration	p/z	Displacement (dy/dx)	p/z
Age (years)	0.020	0.355	0.020	0.213	-0.002	0.122
Gender (female)	-0.654	0.612	0.363	0.456	0.002	0.961
Married	3.125*	0.071	-0.075	0.931	-0.087	0.161
Divorced	4.134	0.559	-20.033	0.997	-0.002	0.993
Separated	3.955*	0.096	1.062	0.650	-0.182	0.329
Widowed	3.945*	0.088	0.407	0.727	-0.137	0.128
Marital status (Other)	2.915	1.000	0.188	1.000	-0.094	1.000
Number of own children	-0.643***	0.011	-0.080	0.545	0.023**	0.020
Up to GCE O/L	-1.349	0.106	0.337	0.614	0.029	0.487
Passed GCE O/Ls	-2.417	0.017	0.106	0.891	0.073	0.132
Passed GCE A/Ls	-17.858	0.993	1.479	0.113	0.094	0.166
Above GCE A/Ls	-12.671	0.998	-15.659	0.998	0.296*	0.083
Education other	-1.659	0.204	-0.330	0.595	N/A	N/A
Ownership of residence	-1.659	0.204	-0.330	0.595	0.065	0.187
Farming	0.925	0.598	-3.458**	0.039	0.143	0.141
Ownership of cultivated land	-5.475**	0.019	1.437	0.307	0.134	0.363
Total farming area (ha)	0.669	0.172	0.379	0.134	-0.038**	0.047
Paddy	1.174	0.303	-0.074	0.933	-0.031	0.579
Crops	2.988**	0.039	1.008	0.454	-0.138*	0.084
Animal Husbandry	-2.915***	0.012	-16.666	0.993	0.909	0.992
Inland fishing	-0.536	0.614	-12.613	0.997	0.638	0.997
Marine fishing	2.298**	0.022	-16.033	0.997	0.724	0.997
Farming fishing forestry	2.286**	0.029	-0.707	0.308	-0.043	0.956
Government sector	-13.630	0.993	-0.837	0.310	0.120	0.265
Private sector	2.642*	0.067	-0.697	0.379	-0.057	0.959
Skilled/Semi-skilled/unskilled labour	0.229	0.885	-0.168	0.766	0.002	0.971
Self Employed	-13.936	0.992	-0.903	0.198	0.123	0.243
Employment (Other)	-11.710	0.998	0.718	0.458	0.026	0.835
Average total monthly income	0.000032***	0.002	0.000	0.312	0.000008***	0.008
HH asset – lands	0.724	0.36	0.152	0.793	-0.029	0.434
Floods	0.104	0.852	-0.028	0.981	-0.002	0.978
Droughts	-0.288	0.729	0.724	0.532	-0.027	0.663
Landslides	-0.662	0.59	0.873	0.488	-0.024	0.744
Salinity/sea water intrusion	1.535***	0.012	-16.450	0.993	0.767	0.993
Intercept coefficient	-8.150***	0.001	-4.290**	0.034	N/A	N/A

Note: \*-Significant at 10%, \*\*-Significant at 5%, \*\*\*Significant at 1%

Source: Authors' estimations using primary data

### 3.3 VARIATION IN MOBILITY BY GROUPS

This analysis is conducted at the individual level to understand the differences among different groups in their likelihood to pursue human mobility when faced with climate change. The discussion first focuses on men versus women, then youth versus adults, differently abled persons versus others and women HHH versus men HHH.

### 3.3.1 Women vs Men

In this sample of 5724 individuals, 2088 are men while 2114 are women when men and women are considered adults at the age of 18 or more. As such, in this sample, among all adults, there are equal proportions of men and women. However, when individuals are disaggregated by their mobility status, among those staying back, 941 women account for 56 per cent, while 742 men account for 44 per cent. This shows a larger proportion of women among left behind (Table 3 - 21). On the contrary, among migrants, the 1173 women account for a smaller share of 47 per cent. This indicates that men are more likely to be mobile than women in HHs exposed to climate events.

Table 3 - 21: Mobility status by gender

	Men			Women			Total
	No.	% of all men	% by mobility status	No.	% of all women	% by mobility status	
Non mobile	742	36	44	941	45	56	1683
Mobile	1346	64	53	1173	55	47	2519
Total	2088	100	50	2114	100	50	4202

Source: Authors

When exposed to rain/floods, among all adults and mobile persons, there is a near equal split between men and women. As shown in Table 3 - 22, there are 51 per cent of women among all exposed to rain/floods, while 49 among those were exposed to rain/flood and were mobile. However, among left behind individuals 55 per cent were women. Among both men and women, mobile shares are larger than the left behind share. Regarding those that experienced landslide among all adults, the gender split is equal. Moreover, among mobile persons and those left behind, the two genders also have equal distribution. In the case of those exposed to drought among all individuals, there is a near equal split between the two genders, with women accounting for 49 per cent. However, a much larger 58 per cent of those left behind are women, while among mobile persons, the share of women is very low at 40 per cent. A similar pattern is also seen in those who experienced sea level rise/salinity, where the equal gender split between all individuals, while among those left behind, there is a larger proportion (57%) of women and a smaller share among mobile persons (44%).

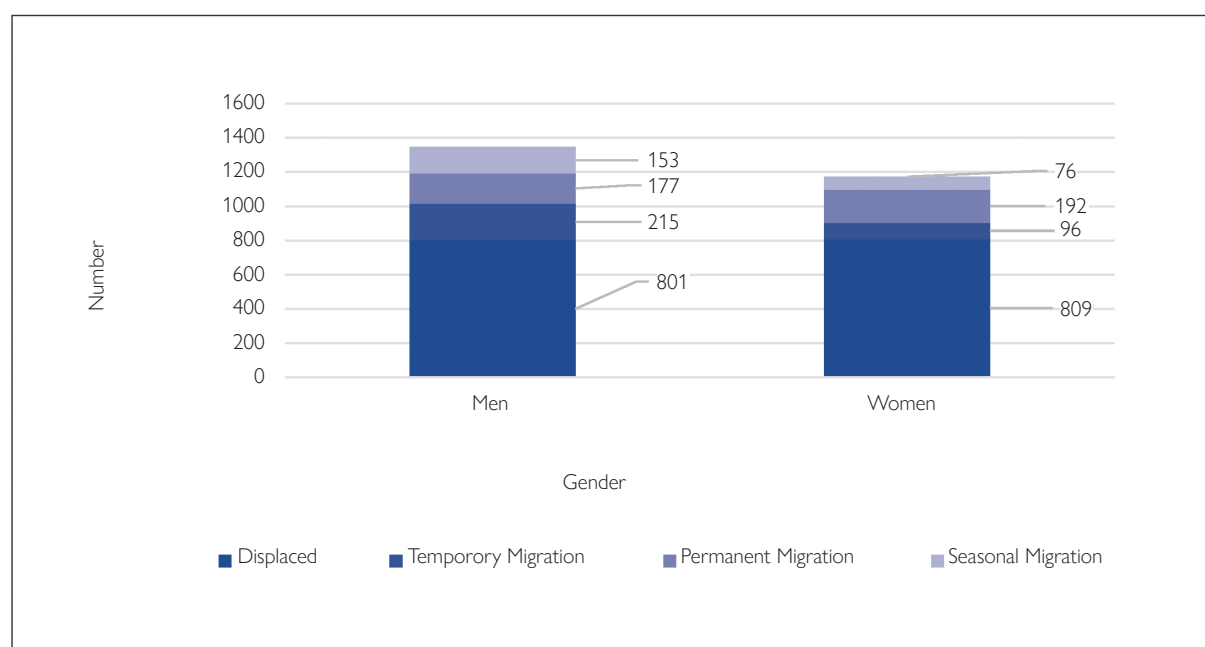
The above analysis reflects two distinct patterns across sudden onset and slow onset climate events and extreme weather events by focusing on one of each type. Specifically, regarding such events, there is a greater likelihood for women to be left behind. On the contrary, concerning the sudden onset of events there is not much of a distinction between men and women. The mobility and related selection and decision making process relevant to these two types of events explains these two patterns seen. For instance, when faced with a flood or landslide, there is no selection about who moves to a shelter versus who stays back. In most cases, all members of a HHs would seek shelter in a safe place. As such, there is an underlying selection or decision making process regarding mobility that favours either of the genders. On the contrary, when faced with slow onset climate disasters and extreme weather events, often the impact is gradually felt over time, with sufficient time for the HH members to select who among HH members are better suited for migration. As evident in the detailed qualitative data analyses in the case of left behind individuals, often such event-related migration is triggered via the need to earn a higher income and the patriarchal society in Sri Lanka. These instances are more likely to favour sending men as migrants than women. Such family level decisions making was evident in the qualitative data discussed in other chapters.

Table 3 - 22: Mobility Status by Gender and Climate Event.

Climate event	Mobility status	Men			Women			Total
		No.	% of all men	% by mobility status	No.	% of all women	% by mobility status	
Rain/flood	Left behind	255	33	45	308	38	55	563
	Mobile persons	524	67	51	507	62	49	1031
	Both groups	779	100	49	815	100	51	1594
Landslide	Left behind	157	30	49	163	31	51	320
	Mobile persons	358	70	50	360	69	50	718
	Both groups	515	100	50	523	100	50	1038
Drought	Left behind	223	42	42	305	60	58	528
	Mobile persons	305	58	60	205	40	40	510
	Both groups	528	100	51	510	100	49	1038
Salinity/sea level rise	Left behind	218	43	43	290	56	57	508
	Mobile persons	294	57	56	230	44	44	524
	Both groups	512	100	50	520	100	50	1032

Source: Authors

Figure 3 - 13: Types of Mobility of Women Versus Men



Source: Authors

Across men and women, there is a notable difference in the shares of temporary and seasonal migrants. Specifically, when among men, temporary migrants accounted for 16 per cent, the corresponding share among women was half of it (8%). Similarly, among men, when seasonal migration accounted for 11 per cent among women, it was a near half of it (6%). According to the findings, it is evident that when there is a possibility for a prior selection process, as in the case of temporary or seasonal migration mainly for livelihood purposes, women are less likely to migrate (see Figure 3 - 13).

### 3.3.2 Youth vs Adults

This analysis considers only those aged 15 or over and youth in the age groups of 15-24 and adults over 25 years. This sample includes 930 youth and 3562 adults, while 1232 under the age of 15 years are disregarded in this analysis. Among the youth, there is a higher proportion of mobile individuals (62%) than among adults (62%). But among all adult and youth mobile persons, adults account for 79 per cent while youth only account for 21 per cent.

Regarding those experienced rain/floods, among adults and youth, mobile persons account for nearly two thirds (see Table 3 - 23). Among both mobile persons and those left behind, adults account for about 80 per cent, while youth accounts to close to a fifth (20%) (Table 3 - 23). A similar, nearly two thirds of mobile persons among adults faced with landslide was seen. However, in the case of youth, the mobile persons' proportion is much higher at 78 per cent. Similarly, when adults accounted for 79 per cent, youth were only 21 per cent. As evident in row 7 and columns 3 and 6, among left behind youth was a smaller proportion of 14 per cent. As shown in rows 10-15 for drought and sea level rise/salinity among both adults and youth, the share of mobile persons and left behind persons were roughly similar. In the case of a split between adults and youth among mobile persons and left behind, the shares were approximately 80 per cent and 20 per cent, respectively (see Table 3 - 23).

This reflects that for rapid onset events, a higher share of adults and youth are associated with mobility than left behind; on the contrary, the share of mobile persons and left behind persons is almost similar for sea level rise and droughts. At the same time, consistent with the overall distribution of adults and youth, youth account for about a fifth among mobile persons and left behind.

Table 3 - 23: Distribution of Human Mobility by Youth and Adults when Exposed to Climate Events.

Climate event	Mobility status	Adults			Youth			Total
		No.	% of all adult	% by mobility status	No.	% of all youth	% by mobility status	
	Left behind	1438	40	80	353	38	20	1791
	Mobile persons	2,124	60	79	577	62	21	2701
	Total	3562	100	79	930	100	21	4492
Rain/flood	Left behind	476	35	80	121	33	20	597
	Mobile persons	867	65	78	248	67	22	1115
	Both groups	1343	100	78	369	100	22	1712
Landslide	Left behind	286	32	86	46	22	14	332
	Mobile persons	606	68	79	161	78	21	767
	Both groups	892	100	81	207	100	19	1099
Drought	Left behind	445	51	78	127	54	22	572
	Mobile persons	435	49	80	108	46	20	543
	Both groups	880	100	79	235	100	21	1115
Salinity/sea level rise	Left behind	430	49	79	114	49	21	544
	Mobile persons	440	51	78	121	51	22	561
	Both groups	870	100	79	235	100	21	1105

Source: Authors

In both groups, youth and adults, the most popular type of mobility was displacement, followed by permanent migration. Temporary and seasonal migration was very low among both adults and youth, while lowest among youth. Among youth, the share of permanent migration share was 16 per cent, which is higher compared to adults (see Table 3 - 24).



Table 3 - 24: Distribution of Mobility Type Among Adults and Youth.

Mobility Type	Adults		Youth	
	No.	%	No.	%
Displacement	1,355	63.79	382	66.2
Temporary migration	257	12.1	63	10.92
Permanent migration	314	14.78	94	16.29
Seasonal migration	198	9.32	38	6.59

Source: Authors

### 3.3.3 Differently Abled vs the Rest of the Sample

This analysis focuses on all individuals regardless of their ages and the sample is disaggregated by their differently abled status. Of the full sample of 5724, only 389 are identified as differently abled. The share of differently abled individuals is approximately 7 per cent. The different abilities considered here and their distribution in the sample are presented in Table 3 - 25. Among the types of different abilities considered, the most common was difficulty seeing even with spectacles (65%) and walking even a short distance or climbing steps, which was reported by around 39 per cent. Other issues reported included difficulty hearing (14%) and cognition, self-care and communication difficulties.

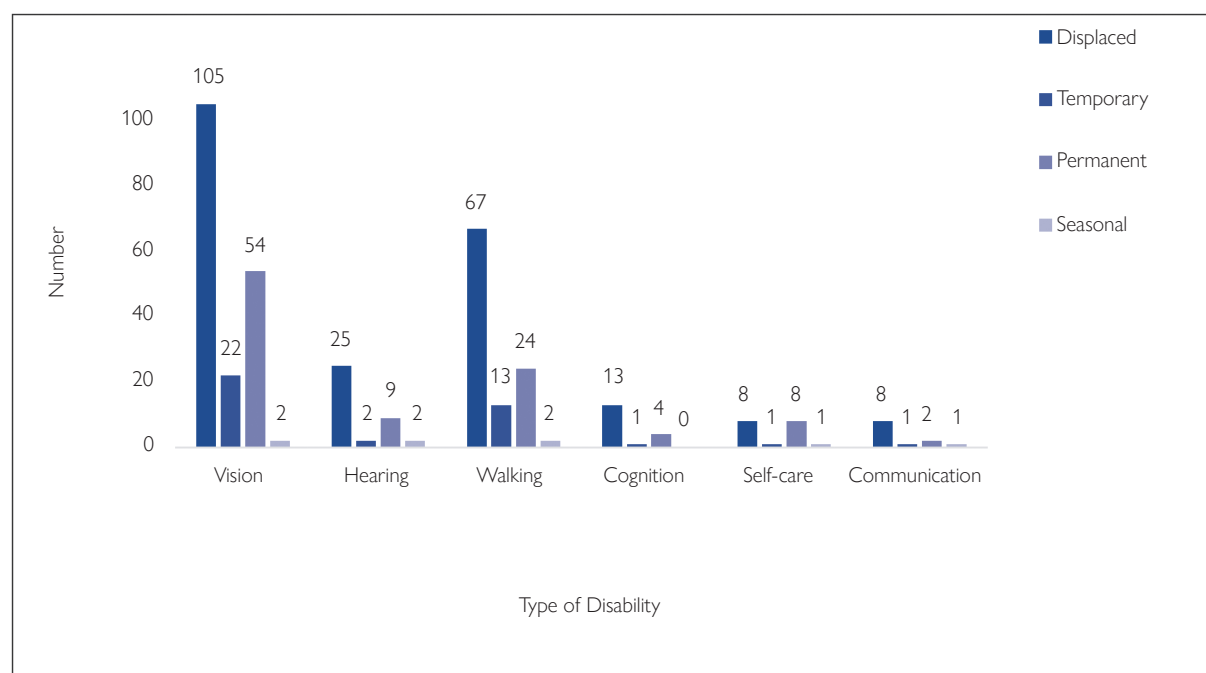
Table 3 - 25: Composition of Differently Abled Individuals.

Type of vulnerability	No.	% of total individuals in sample
Differently abled	389	7
Disability		% of differently able individuals by disability
Difficulty seeing even with spectacles	253	65
Difficulty walking short distance or around 12 steps in stairway	151	39
Difficulty hearing even with use of hearing aids	54	14
Cognition issues; difficulty remembering/concentrating	29	7
Self-care issues; difficulty with daily self-care tasks	29	7
Communication difficulty due to physical or mental reasons	17	4

Source: Authors

Across all types of mobilities among differently abled, most were recorded under displacement. Specifically, among the displaced 105 individuals were with vision issues, 25 with auditory issues and 67 with walking issues. Among other different abilities, displacement numbers were higher than other types of mobility (Table 3 - 25). This indicates that unlike in other types of mobility, displacement does not allow a selection process but necessitates all HH members to move. Similarly, permanent migration/relocation/resettlement reflects high numbers of mobility among differently abled individuals. Specifically, 54 had vision issues, 24 with mobility issues and 9 with hearing issues and 8 with self-care difficulties. In contrast, temporary and seasonal migration has relatively smaller numbers of differently abled persons among migrants. Specifically, only 22 with vision issues have temporarily migrated, while among seasonal migrants, it is a much lower 2 individuals. At the same time, only 13 individuals with issues in walking were among temporary migrants, while only 2 were among seasonal migrants (see Table 3 - 26).

Figure 3 - 14: Distribution of The Type of Mobility Among the Differently Abled



Source: Authors

Table 3 - 26 :Composition of Mobility Types of Differently Abled Persons and People with No Disability

Climate event	Mobility status	People with no disability			Differently abled			Total
		No.	% of all people with no disability	% by mobility status	No.	% of all Differently abled	% by mobility status	
	Left behind	2,237	42	95	123	32	5	2360
	Mobile persons	3,098	58	92	266	68	8	3364
	Both groups	5335	100	93	389	100	7	5724
		No.	% of all men	% by status	No.	% of all women	% by status	
Rain/flood	Left behind	730	36	95	35	22	5	765
	Mobile persons	1,271	64	91	127	78	9	1398
	Both groups	2001	100	93	162	100	7	2163
Landslide	Left behind	385	30	93	30	27	7	415
	Mobile persons	880	70	92	81	73	8	961
	Both groups	1265	100	92	111	100	8	1376
Drought	Left behind	714	54	94	49	46	6	763
	Mobile persons	610	46	91	58	54	9	668
	Both groups	1324	100	93	107	100	7	1431
Salinity/sea level rise	Left behind	719	51	98	15	60	2	734
	Mobile persons	684	49	99	10	40	1	694
	Both groups	1403	25	98	25	100	2	1428

Source: Authors

### 3.3.4 Women as Heads of Households

In this sample of 1501 HHs, 266 are female HHHs. Among them, 128 are from HHs that moved together and 28 are individual level mobile persons, meaning despite being away from the family at some point, they were still considered the HHH. Another 110 were heads of left behind HHs (Table 3 - 27).

Table 3 - 27: Household Head by Mobility Type

Head of the HH's gender	Entire HH moved	Individual/s moved from HH	No mobile persons from HH	Total
Male	608	187	440	1,235
Female	128	28	110	266
<b>Total</b>	<b>736</b>	<b>215</b>	<b>550</b>	<b>1,501</b>

Source: Authors

Among female HHH, concerning the type of mobility faced, there is a clear dominance of displacement, which accounts for nearly two thirds of all female HHH. On the contrary, among male HHH, exposure to displacement is a much smaller proportion of 59 per cent . Apart from displacement, women HHH have faced permanent migration in large numbers. Specifically, 35 HH or 22 per cent, were permanently migrated HHH. On the contrary, among male HHH temporary migration, permanent migration and seasonal migration all accounted for nearly similar shares of 13-14 per cent. In the case of female HHH, temporary migration was only 7 per cent, while seasonal migration was a much smaller 4 per cent (Table 3 - 28).

Table 3 - 28: Mobility Types Based on Household Heads

Type of mobility	Female hhh		Male hhh	
	No.	%	No.	%
Displacement	103	66	472	59
Temporary migration	11	7	107	13
Permanent migration	35	22	109	14
Seasonal migration	7	4	107	13
<b>Total</b>	<b>156</b>	<b>100</b>	<b>795</b>	<b>100</b>

Source: Authors

In this sample, the share of female HHH ranged between 10-21 per cent of all HHHs for each type of climate exposure. Among this, the highest 21 per cent was recorded for landslide and drought, while the lowest 10 per cent was associated with salinity.

When faced with rain floods, 65 per cent of female HHHs have moved, while when faced with landslides, this was 74 per cent. When faced with salinity, 42 per cent of female HHH have moved, while for drought, this is 46 per cent. This shows that a larger share of female HHHs is likely to stay back for such events. On the contrary, for rapid onset events, a larger share of female HHH tends to move (Table 3 - 29).

Table 3 - 29: Distribution of Mobility By Gender of the Head of the Household when Exposed to Climate Events.

Climate event	Mobility status	Female hhh			Male hhh			Total
		Freq.	% of mobility status	% of hhh	Freq.	% of mobility status	% of hhh	
Rain/flood	Left behind	35	35	19	149	33	81	184
	Mobile persons	65	65	18	304	67	82	369
	Both groups	100	100	18	453	100	82	553
Landslide	Left behind	20	26	18	91	30	82	111
	Mobile persons	56	74	21	208	70	79	264
	Both groups	76	100	20	299	100	80	375
Salinity/sea level rise	Left behind	25	58	16	131	44	84	156
	Mobile persons	18	42	10	170	56	90	188
	Both groups	43	100	13	301	100	88	344
Drought	Left behind	37	54	21	137	43	79	174
	Mobile persons	31	46	15	182	57	85	213
	Both groups	68	100	18	319	100	82	387

Source: Authors

### 3.4 Summary

This chapter focuses on analyzing data collected through a survey of 1501 HHs consisting of 1105 migrant HH and 396 HHs with no mobile persons from 15 districts that have experienced severe cases of drought, floods, landslides and sea level rise-related issues. The study finds that mobile persons are more concentrated in the prime working ages. The proportion of males among those migrating is higher than females, but the proportion of males among those left behind is less than the proportion of females. The gender differences across mobile and left behind populations indicate that females are more likely to be left behind. However, there was no major difference in education levels across mobile and left behind populations. Overall, HHs with mobile persons have reported a higher mean monthly HH income. The econometric model for determinants of migration shows that at the individual level characteristics, such as being a male, ethnicity being Tamil and Muslim, level of education, monthly income, in terms of ownership of assets such as buildings and animals and exposure to floods or heavy rains or landslides are positively correlated with one's probability of migration. By contrast, characteristics such as age, ownership of plantations and/or crops and exposure to sea level rise or salinity are negatively associated with one's probability of mobility. However, the absence of a scientific explanation challenges the associated statistical significance. At the HH level, characteristics such as HHH's age, having a married HHH, Tamil ethnicity of HHH and ownership of plantations/or crops are correlated with a lower probability of migration.

In the case of displacement there were near equal shares of women and men. Displacement has a clear correlation as a response strategy when faced with sudden onset climate events. Victims easily identify such dramatic movement from the place of residence to a shelter as climate-induced mobility; this is in contrast to the indirect and lengthy connection between slow onset events and extreme weather events with mobility. Qualitative data reveal that modern technology is helpful in rapidly alerting a large group of people on social media or early warning alarm systems. For victims of landslides, relocation involves a lengthy process, which often contributes to a longer stay in shelters. Climate events that necessitate displacement often involve both social and financial loss and damage, for which various support is needed. The majority had received support from the government. However, qualitative data reveal that accessibility to support is unequal and there are instances of corruption in the distribution of relief and support measures.

Temporary migration can be either a response or a recovery strategy when faced with climate disasters. HHs are more likely to select the most suitable family member for migration. Two thirds of temporary migrants were men, while temporary migrants were disproportionately distributed in the working ages.

Unlike in the case of displacement, in the case of temporary migration, there is an overemphasis on economic reasons and the under-identification of climate events as reasons for migration. The economic push factors highlighted included unreliable harvest/lack of food security in origin and higher income in the destination. The majority had temporarily migrated from the origin areas like Anuradhapura, Hambantota, Matara and Monaragala where drought and sea level rise are highly prominent. Similarly, many migrants have temporarily moved away from the areas like Badulla and Nuwara-Eliya. The support for drought-affected communities relative to those exposed to sudden onset events is limited. Reflecting economic reasons and pull factors for temporary migration, key destinations for temporary migration are Colombo and Gampaha.

Seasonal migrants also identified economic push and pull factors as drivers of migration. Most seasonal migrants have originated from areas prone to slow onset and extreme weather events, while destination areas are those with well-established seasonal migration corridors and networks.

Similar to displacement, permanent migration/relocation/resettlement also reflects a clear correlation between exposure to climate events. However, relocation or permanent migration is a difficult decision to make and is often made as a last resort. Some were relocations done willingly, while some were not and the government provided incentives in some cases. However, there may be a negative overcast on their relocation experience in the case of forced relocation. During the phases of response and recovery related to climate disasters, mobility plays a large role, though not adequately understood by those exposed to the same disaster.

This chapter also deals with the variation in human mobility across different vulnerable groups and the coping strategies adopted by vulnerable groups among those left behind. The variation in mobility focused on gender, men versus women, youth versus adults, women as HHH and people with disabilities. Among all adults, there are equal proportions of men and women. Noticeably, a larger proportion of women among left behind and among mobile persons, women account for a smaller share. This indicates that men are more likely to pursue human mobility than women in HHs exposed to climate events.

According to the analysis of the distribution of human mobility by gender presented in this chapter, when exposed to climate events like rain/floods, landslide, drought and sea level rise, distinct patterns can be seen across sudden onset, slow onset climate and extreme weather events. Specifically, with regard to slow onset events and extreme weather events, there is a greater likelihood for women to be left behind. On the other hand, there is hardly a distinction between sudden onset events between men and women.

This chapter further finds that the most popular type of mobility was displacement for both adults and youth, temporary and seasonal migration was very low among them. When exposed to sea level rise and drought events, in terms of both adults and youth, the shares of mobile persons and those left behind are almost similar. But both groups tend to move rather than stay back for rapid onset events. For the differently abled persons, most human mobility was recorded under displacement and permanent migration than under temporary or seasonal migration. The most common different abilities among the displaced were vision, walking and auditory-related issues. The findings confirm that displacement and permanent migration does not allow a selection process but necessitate all HH members, including differently abled to move. At the same time, temporary and seasonal migration shows that there are some differently abled persons among migrants.

The chapter's findings show the number of female HHHs that faced displacement and permanent migration is larger than those exposed to temporary or seasonal migration. Corroborating this, the study also finds that a larger share of female HHHs is likely to be left behind for slow onset events and extreme weather events.

## 4. VULNERABILITY AND CLIMATE MOBILITY

Climate change affects different people in different ways. At the same time, their possibility to become mobile when faced with or as a consequence of climate events vary. Some groups are affected more than others. This chapter explores how specific vulnerable groups are affected by climate change-related events, their mobility and coping mechanisms when left behind. The first part of this chapter delves into the characteristics of vulnerable groups that move due to climate change in section 4.1 to address RQ1.<sup>17</sup> The second part of the chapter deals with the left behind vulnerable groups. Here the analysis focuses on children, the elderly, women and female HHHs and examines the impact of climate disasters and migration on them and how they cope with the associated challenges (RQ 5).<sup>18</sup> This second part of the analysis uses qualitative data and approaches.

### 4.1 CLIMATE MOBILITY AMONG VULNERABLE GROUPS

This section showcases the demographic, social and economic characteristics of vulnerable groups, which are children, youth, females, the elderly and differently abled that take up human mobility<sup>19</sup> when exposed to climate change. First, the characteristics of individual migrants who fall into these vulnerable groups are discussed. Subsequently, HH level characteristics are considered by focusing on HHs with the vulnerable group considered.

#### 4.1.1 Children

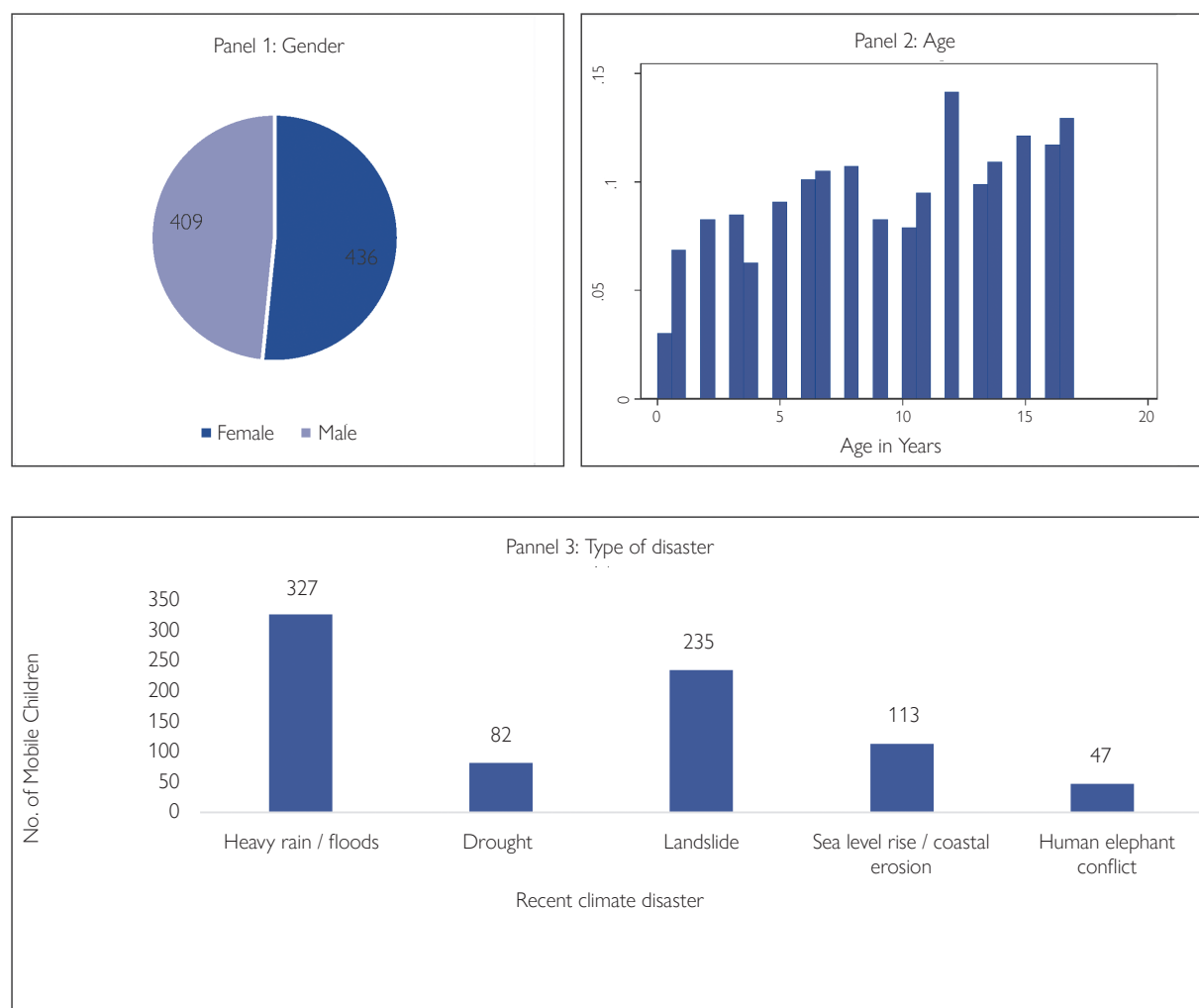
Among the total of 2360 individual mobile persons, there are 845 children between the ages of 0 to 17 years. At the HH level, in this sample of 1501 HHs, 812 children migrated with the entire HHs and 33 children migrated with at least one other migrant but not the entire family. The individual level analysis of child migrants is based on this 845. Among them, 436 (52%) are female and 409 (48%) are male. The mean age of child migrants is 9.6 years, with a standard deviation of 4.97 years in panel 2 (see Panel 2 in Figure 4 - 1 for age distribution and panel 1 for gender). Consistent with age distribution, the education levels reflect that the majority were educated up to grade 6-10. In the case of the relationship to HHH, the majority is the child of the HHH and 2<sup>nd</sup> largest number are the grand children of HHHs. As expected, except for 8 children employed and 31 unemployed, others are students or young children. Regarding types of mobility experienced, 74 per cent of child migrants are those who had experienced temporary displacement, while 17 per cent are temporary migrants. This high proportion of mobility with the rest of the HH is more likely to occur among children. Among these children exposed to human mobility, the average duration during most recent mobility was 253 days. As reflected by the standard deviation of 603 days, the distribution of duration is not normally distributed. This is mainly due to the duration of different types of mobility. Specifically, the average duration for displacement was 74 days, again with a very high standard deviation of 328 days. This is likely because when HHs were destroyed, some stayed in temporary shelters for an extended period of time until a new home was built. For permanent migration, the average duration is 1057 days (852 standard deviation), 368 days for temporary migration (763 standard deviation) and 76 (52 standard deviation) days for season migration. In this sample of 845 children, as indicated in panel 3, the majority were mobile due to sudden impact events - namely heavy rain/flood (327), followed by due to landslides. The mobility due to drought and sea level rise is relatively less. Additionally, some mobility was also due to human-elephant conflict. Among those displaced, most (58%) were displaced to houses of friends, relatives or neighbors, while other locations were temporary shelters.

<sup>17</sup> RQ 1 - What are the demographics and characteristics of the vulnerable groups that migrate due to climate change?

<sup>18</sup> RQ 5: What is the impact of human mobility on those left behind, specifically on vulnerable groups and their coping mechanisms (children, elderly and women – female headed households)?

<sup>19</sup> See discussion on RQ 5 in Section 4.1, for vulnerable groups among left behind people.

Figure 4 - 1: Characteristics of Mobile Children



Source: Authors

#### 4.1.2 Youth

There are 577 mobile youth in the sample, defined as those between the ages of 15 and 24. As seen in the second panel in Figure 4 - 2, youth are distributed nearly uniformly within this age group. In this group, the average age is 19.41, with a standard deviation of 2.85 years. Unlike among the previously discussed vulnerable group of children, there is a clear majority of males among youth. Specifically, males account for 59 per cent of mobile youth, while females account for a much lower 41 per cent. Such a male majority among mobile youth is in contrast to the gender distribution of all youth (mobile and non-mobile), whereas males account for only 52 per cent of all youth. As such, the higher share of males among mobile youth provides some indication of selection/preference of male youths for migration.

Of these mobile youth, 486 were children of HHH and only one each was there, who is the parent, sibling and aunt or uncle of the HHH. Among these 577 youth, 495 were unmarried, while only 72 were married. This high share of unmarried youth is likely to do with the age bracket considered as a youth as a similar proportion of unmarried are also among non-mobile youth.

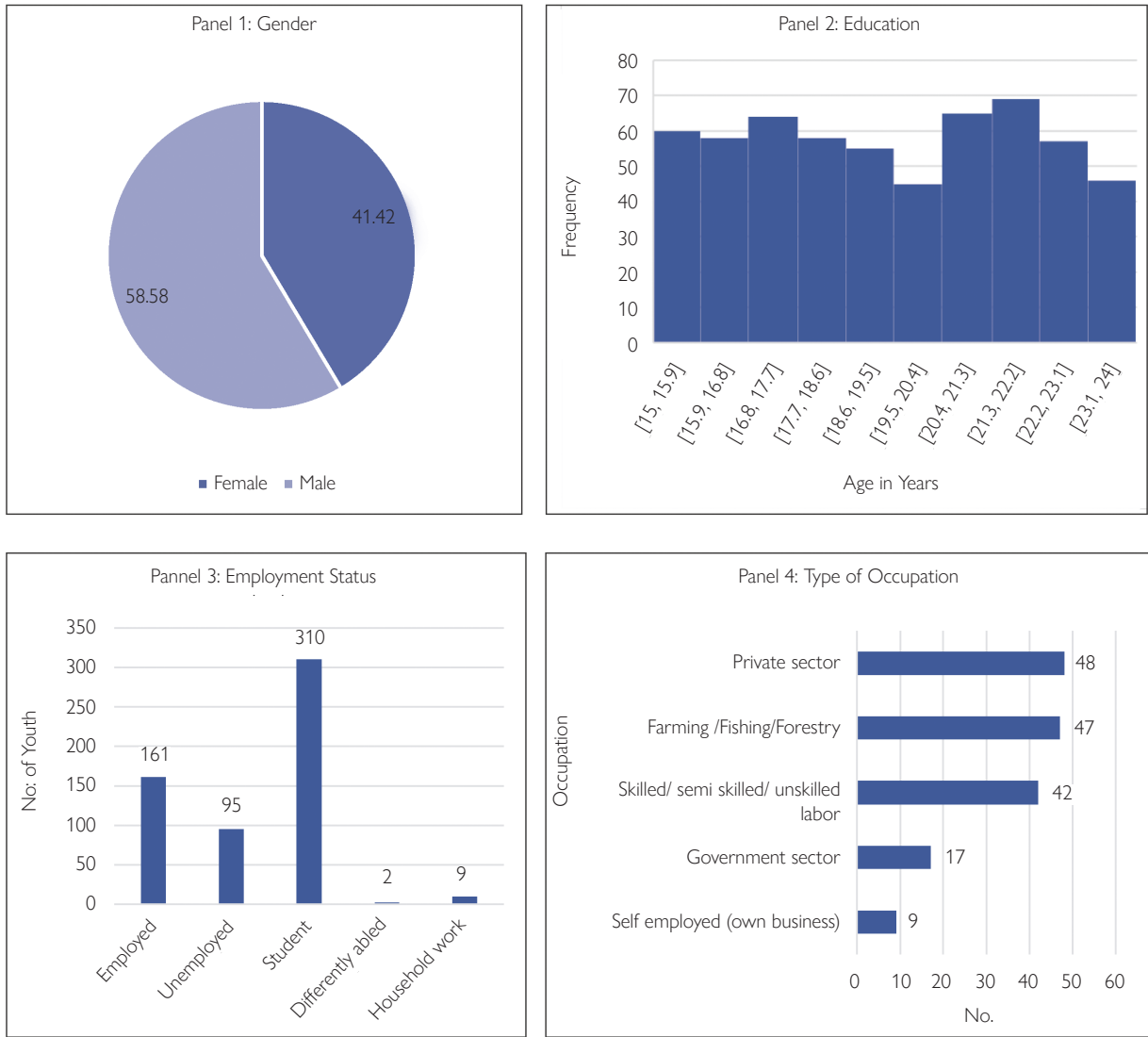
Most mobile youth were educated up to grades 11-13 and the second highest were from grade 6-10. Higher educated youth were few in this sample. Specifically, only 13 and 5 undergraduates and diploma holders were included, respectively and only 1 was a postgraduate. Most of those surveyed are students, which is consistent with the age bracket. The next largest group is employed. Here, it is interesting to note that the share of employed youth is higher among mobile youth than among non - mobile youth. Specifically, compared to 21 per cent of youth employed among those non-mobile, it is a higher proportion at 29 per cent among mobile youth.

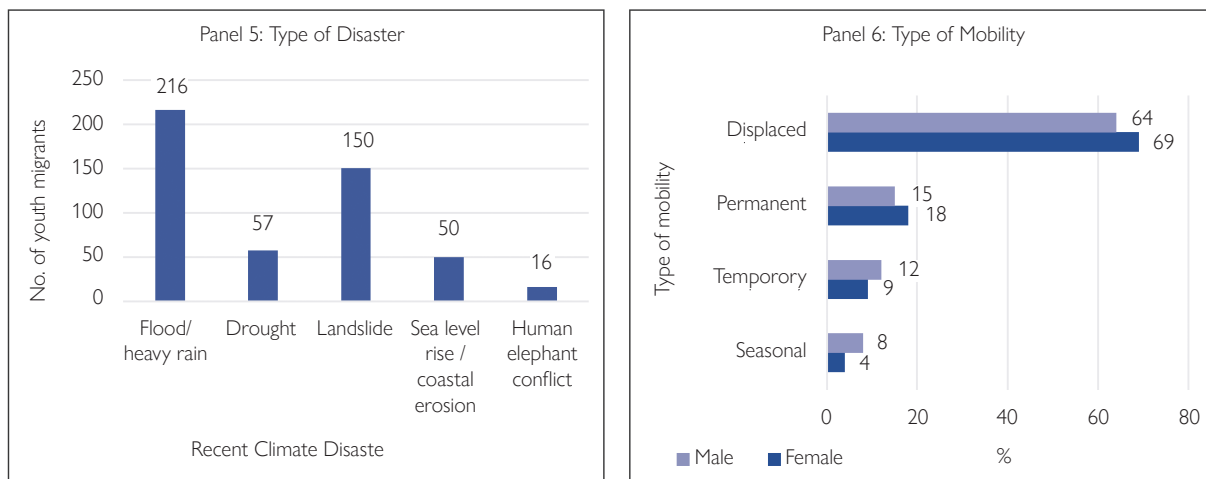


The most common type of occupations among working youth is private sector occupations and agriculture-related activities, closely followed by skilled, semi-skilled or unskilled labour occupations. Among the working youth, the average monthly income is LKR 26,569.54 (standard deviation 15,150.14). This average income of mobile youth is higher than the average income of LKR 23,812 of youth non-mobile. This confirms the higher income earning capacity and motive associated with internal migration in Sri Lanka among Sri Lankan youth.

With regards to the type of climate events that necessitate human mobility, floods are the highest faced disaster among youth followed by landslides. Specifically, 216 youth had reported having faced floods/heavy rains as the reason for mobility, while 150 have reported landslides. Only a few youths have reported mobility due to drought (57) and sea level rise (50). Such a high significance of rapid onset events is consistent with the finding that the majority of youth have faced displacement. Specifically, 382 youth have experienced displacement and 94 have permanently migrated. This reflects that youth are more likely to move in situations where they migrate with the rest of the HH. Confirming this, only 63 youth had migrated temporarily and 38 migrated seasonally.

Figure 4 - 2: Characteristics of Mobile Youth





Source: Authors

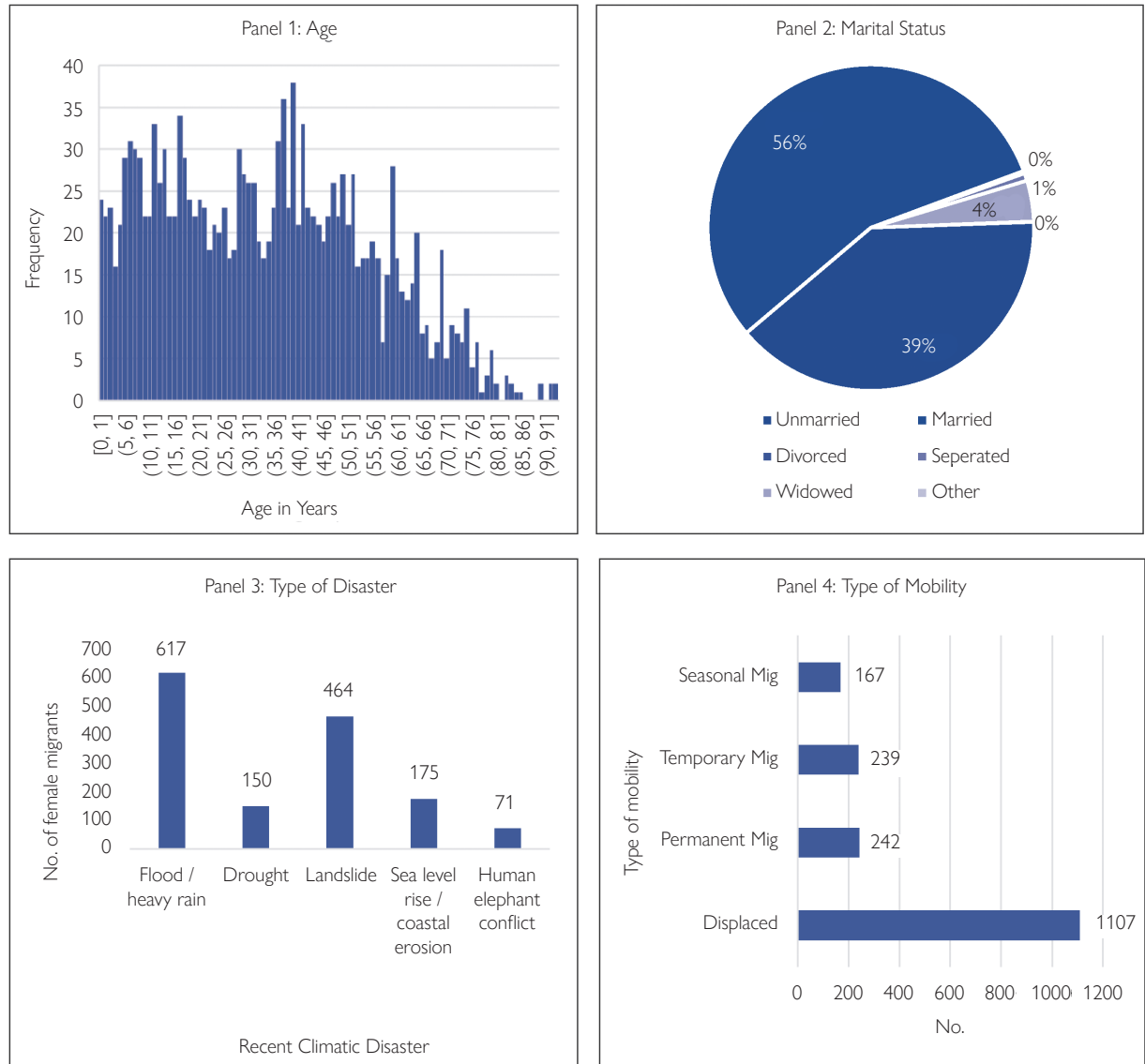
Moreover, among these youth, 237 were displaced to temporary housing – including into houses of known people such as friends, relatives or neighbors. Another 140 were displaced to a temporary shelter. Given that there was a male majority among youth migrants, next, we explore the type of mobility by gender to understand if there is any gender selection. Here, we see that the shares of displaced and permanent migrants among males are less than that of females, while the share of males is higher for temporary and seasonal migration, which are more likely to be livelihood driven migration choices (see Panel 6 in Figure 4 - 2). This confirms the previously discussed gender sorting among youth migrants is for employment purposes.

#### 4.1.3 Females

Out of the total mobile persons, 1609 were females and their mean age was 34.31 years with a standard deviation of 20.81. The lowest and the highest ages reported in this sample of mobile females were 0 and 93 years, respectively. As depicted in panel 1 of Figure 4- 3, two humps can be seen in the age distribution of females; one around 10 years and the other around 40 years of age. Of the 1609 females, 440 were the HHH and 778 were children of the HHH, while 70 were the grandchildren of the HHH. Among all these migrants, a majority of 935 were married, 753 were unmarried, 5 were divorced while 10 and 11 were separated and widowed, respectively. In the case of education levels, a majority of 564 female migrants were educated up to grade 6-10 and followed by 348 passing O/L. There were only very few female migrants with postgraduate qualifications (only 2). In terms of their activity, 38 per cent of females in this sample were economically inactive as they were either young children, students, elderly or disabled. A 30 per cent of respondents had identified themselves as unemployed, while 26 per cent were employed. Another 6 per cent reported HH activities. Among those employed, the majority of females have identified themselves as self-employed (25%), followed by skilled/semi-skilled/unskilled labour (22%). Others were involved in the private sector (18%), farming (18%) and government (16%) occupations. The average income of female migrants reported a positive income of LKR 19,984.77, with a standard deviation of LKR 18,682.67.

Among climate event-related reasons for mobility, most women have moved due to heavy rains or floods (617), while the next predominant reason is landslides (464). Similar to the case of other vulnerable groups discussed before, females also move mostly due to rapid onset climate events. As such, the number of females that have moved due to drought and sea level rise is much smaller at 150 and 175, respectively. Corresponding to these climate reasons for mobility, the type of mobility indicates a high incidence of temporary displacement, where 1107 females have reported temporary displacement. There were 242 permanent female migrants in this sample and another 239 temporary female migrants. The number of seasonal migrants in this sample was much lower, 167.

Figure 4 - 3: Characteristics of Female Migrants



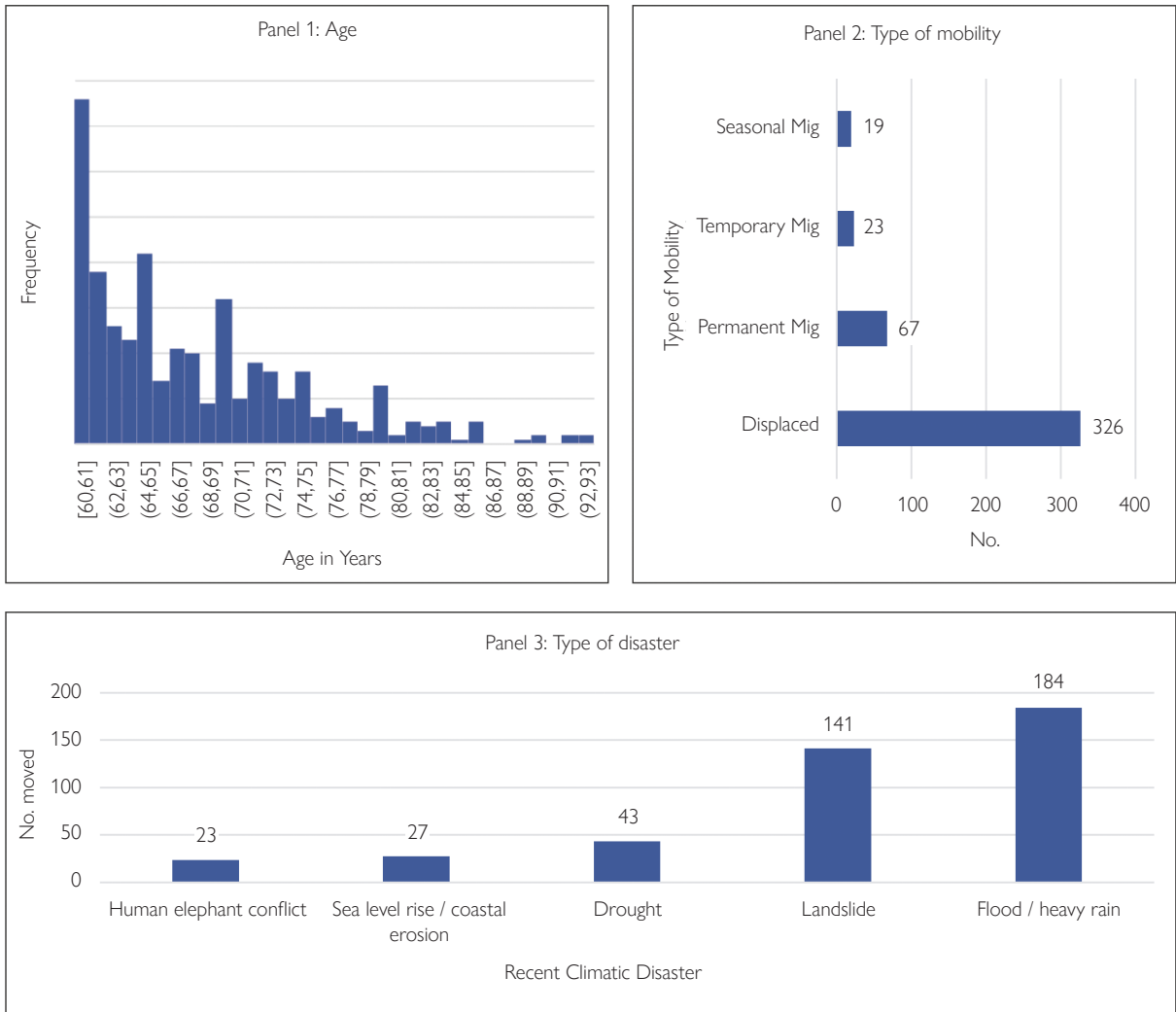
Source: Authors

#### 4.1.4 Elderly

In this analysis, an individual is considered elderly if over 60 or more years of age. As such, this sample contains 435 elderly migrants. The mean age among the elderly migrants is 68.21 years, with a standard deviation of 7.16 years, with an age range of 60 to 93 years. As seen in panel 1 in Figure 4 - 4, the density of mobile elderly peaks around the age of 63 years. With regards to gender, a majority of the elderly are females (52%). In this sample, 259 are the HHHs, while 97 are the spouse of the HHH. Another 56 were identified as a parent or parent-in-law of the HHH. In this sample, 83 per cent were married, while 11 per cent were widowed. Moreover, 5 per cent were unmarried elderly migrants.

In terms of their education, most (38%) were educated up to grades 1-5, while 26 per cent were educated up to grades 6-10. Additionally, a significant number of elders – 82 (19%) have reported no schooling. This is in contrast to other vulnerable groups considered previously in this analysis. Among these 435 mobile elderlies, 192 were currently employed at the time of the survey. The most popular occupations were farming (91 migrants) and skilled/semi-skilled/unskilled labor jobs (25 migrants). Among those earning an income, the average monthly earning was LKR 15209.43 (standard deviation 15549.4).

Figure 4 - 4: Characteristics of Mobile Elderly



Source: Authors

Regarding the type of climate events that caused mobility, in this sample of elders, the most reported was heavy rains and flooding (184), followed by landslide(s) (141). While the mobility for rapid onset events was highly reported, the mobility associated with drought and sea level rise in this sample was relatively small. For instance, only 43 had reported migrating due to drought, while for sea level rise or coastal erosion issues, mobility was reported by 27. In tandem with the types of climate hazards that triggered mobility, the types of displacement indicate a high incidence of temporary displacement among this cohort of elders. Specifically, 75 per cent of these elders have reported temporary displacement during the most recent mobility, while the next largest type of mobility is permanent migration. Reporting of temporary migration and seasonal migration was approximately 5 per cent each. Among those displaced temporarily, the largest number (211) were displaced to temporary housing with neighbours, relatives or friends. Others had moved to temporary shelters, such as those at temples. Among other types of mobility, migration for employment (16) and due to fisheries season (18 respondents) was notable.

#### 4.1.5 Differently Abled

In this sample of 5724 individuals exposed to climate events, 266 are those differently abled and experienced human mobility. This group of migrants have reported diverse types of different abilities. This included vision-related difficulties identified as difficulty seeing even with the use of spectacles, physical mobility<sup>20</sup> issues identified as difficulty walking a short distance or up/down around 12 steps and hearing issues identified as difficulties in hearing even with the use of hearing aids. Self-care-related issues are identified as difficulty with day-to-day tasks such as

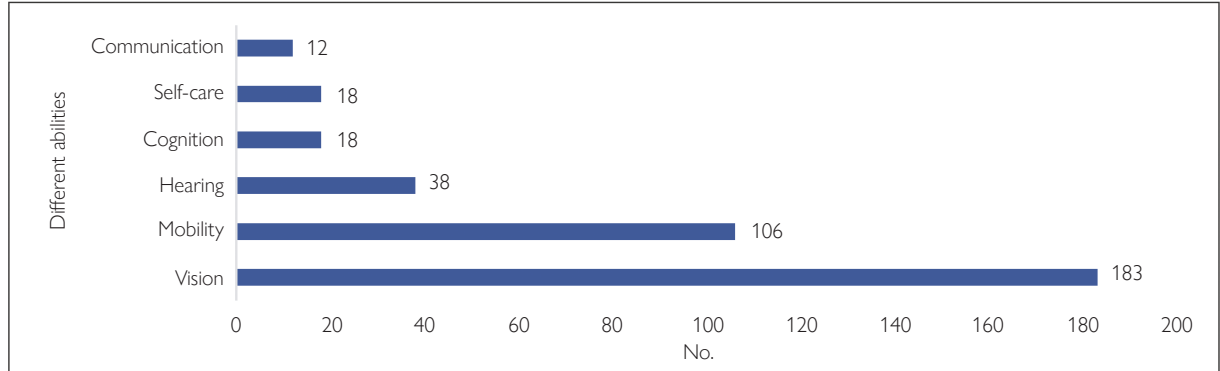
<sup>20</sup> This refers to ability to move within a building as opposed to human mobility.

getting dressed, washing and so on, while difficulties with regards to communication are difficulty in communication due to physical or mental reasons. Cognition issues are those related to difficulty in remembering or concentrating. Among these different abilities, the most commonly reported issue was the vision, with 183 migrants in this sample reporting the same. Another common different ability in this group was physical mobility-related issues, where 106 were affected. Issues related to hearing, self-care, cognition and communication were reported relatively less than the previous two issues.

Among these 266 differently abled and mobile populations, 141 were females and 1225 were males. The average age among these individuals ranged from 7 to 93 years, while the average age was 58.12 years (standard deviation 16.01) (see panel 1 in Figure 4 - 6.)

In this sample of differently abled persons, 137 were HHH, while 71 were the spouse of the HHH. Regarding their marital status, 75 per cent were married, while 14 per cent were unmarried. Unlike in the previous vulnerable groups focused, here is a large proportion of widows (11%).

Figure 4 - 5: Different abilities among migrants

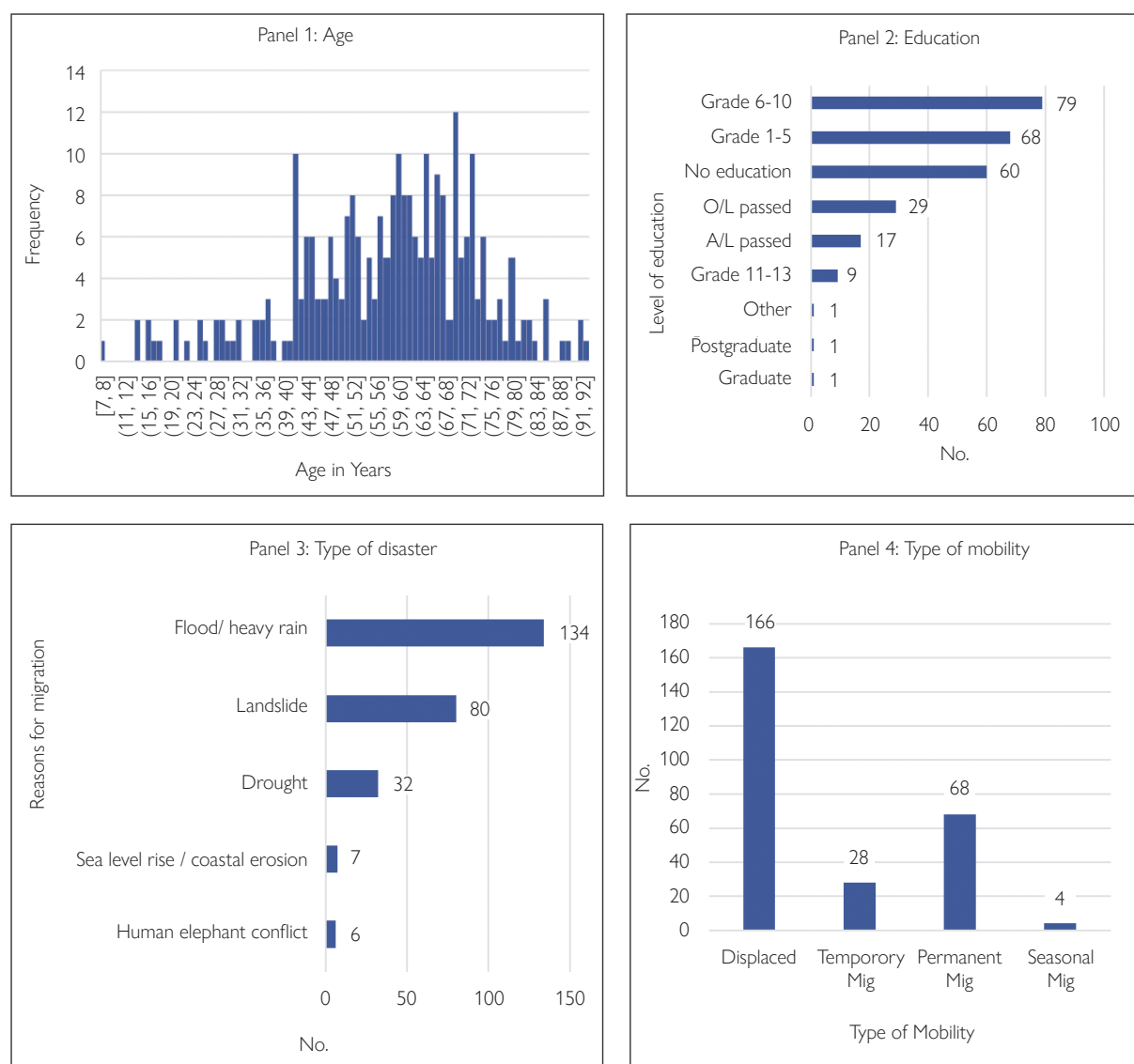


Source: Authors

In terms of their education, nearly 30 per cent have studied up to grades 6-10. Similarly, 26 per cent have studied up to grades 1-5, while 23 per cent have reported not receiving any education. Regarding their economic activities, 109 individuals or (41%) have been employed in this group. The most popular occupation among the employed differently abled migrants is labour jobs in skilled/semi-skilled/unskilled occupations (31%). At the same time, another 23 per cent were involved in farming occupations.

These differently abled individuals have been mobile due to various climate hazards faced. Half of this sample have reported heavy rain or flood as the reason for their mobility, while 30 per cent have identified landslides. While rapid mobility is highly prevalent due to rapid onset events, slow onset events such as sea level rise/coastal erosion and extreme weather events such as drought have been reported less. Specifically, only 32 individuals have reported drought and seven sea level rise/erosion. Corresponding to the significance of rapid onset events, the type of mobility experienced also indicates a high prevalence of temporary displacement. For instance, 62 per cent of the sample has been displaced, while 26 per cent were permanent migrants. These two types often correlate with rapid onset events. Collectively temporary and seasonal migration accounts for a little over 12 per cent of the mobility in this sample. Moreover, over 55 per cent of the differently abled have been displaced to temporary housing with relatives, neighbors and friends.

Figure 4 - 6: Characteristics of Differently Abled Mobile Persons



Source : Authors

## 4.2 LEFT BEHIND VULNERABLE GROUPS AND THEIR COPING STRATEGIES

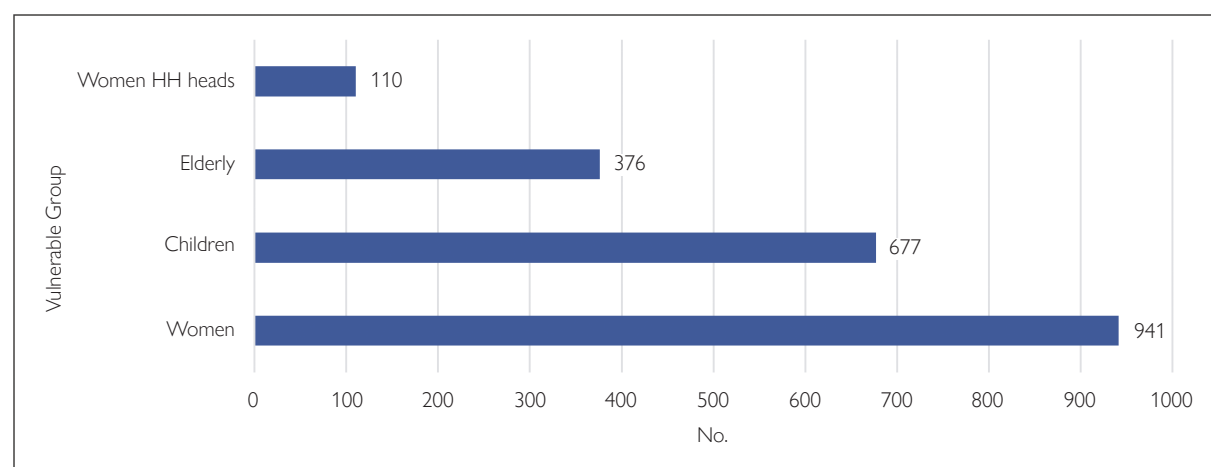
Human mobility inevitably results in a left behind group. This may be left behind individuals in the HH or left behind HHs at the community level. This section addresses RQ 5, which answers what is the impact of human mobility on those left behind ?. In addressing this research question, the focus is on four vulnerable groups – namely children, elderly and women – female headed HHs and their coping mechanisms in response to climate disasters. The analysis is based on quantitative data collected for the study, which are analysed in a descriptive approach, with triangulation by quantitative data collected. To reflect deeper nuances of left behind coping strategies, a case study of a left behind HH is also presented in this section.

In this analysis, a HH is considered mobility exposed if at least one member has pursued human mobility. Other HH members in such HHs are identified as left behind HH members. Similarly, there are HHs with no persons exposed to human mobility; none from the HH has moved. This analysis focuses on left behind members of HHs and left behind HHs.

This sample includes 1501 HHs totalling 5724 individuals. At the HH level, there are 396 left behind HHs (no members from such HHs have moved). The HH members in these left behind HHs amount to 1459 individuals. Additionally, in HHs with people that have moved there are 901 left behind members. As such, this analysis focuses on 2360 left behind individuals at the individual level. Among them are 941 females, accounting for 56 per cent of all adults left

behind. Similarly, 677 children account for 29 per cent of all left behind individuals of all ages. Children are defined as those less than 18 years of age. The elderly is defined as those 60 or more years of age. This left behind sample contains 376 elderly individuals. Among the left behind individuals, 550 are HHs. Among them, 110 or 20 per cent are females (see Figure 4 - 7).

Figure 4 - 7: Vulnerable Groups Among Those Left Behind



Source: Authors

Left behind individuals can be observed across mobile and left behind HHs. As such, there are 661 HH with left behind women, 379 HHs with left behind children, 275 HHs with left behind elderly and 110 left behind women HHs.

Table 4 - 1: Left Behind Households with Vulnerable Groups

HHs with left behind vulnerability type	Number of HHs
Women	661
Children	379
Elderly	275
Women HHs	110

Source: Authors

## 4.2.1 Children

Qualitative data reveal rich nuances of children-specific coping strategies adopted by HHs faced with climate impacts and related human mobility. These coping strategies are discussed under the broad themes of education, quality of life, safety and HH level responsibility. A key area in terms of coping strategies among left behind children is with regard to their education. For instance, a female respondent in a drought-related HH KII in Thanamalwila indicated that when the drought affected their HH income, her family could not afford tuition classes for their eldest son. This resulted in him dropping out of school and pursuing a security job. However, the other children in the family are still going to school; the family cannot afford extra classes (tuition classes for them). Similarly, issues in children accessing education due to a drop in income related to drought was highlighted in the FGD in Anuradhapura. This highlights the absence of coping mechanism provided by social safety nets, especially for slow onset disasters and extreme weather events such as droughts and so on, that adversely affect children's education. When faced with rapid onset events, the impact on children's education and related coping mechanisms are more direct and thus obvious. For instance, respondents to HH KIIs in both Elapatha and Bulathsinghala mentioned that they moved the children's educational books to higher ground along with essential documents to ensure children's education has a minimal impact. This is because there were times when the floods damaged books. In one instance, upon the student's request, the schoolteacher provided a replacement textbook to the student. This shows that support mechanisms to provide replacement textbooks are helpful for students affected by floods. There were also examples of Bulathsinghala flooding, it would take weeks to months to find children's clothes, wash them and prepare for school.



Moreover, a respondent in Elapatha highlighted that their daughter's school did not get flooded but the access road got flooded, leading to her missing school. The FGD in Bulathsingala highlighted that children in that area had missed school up to 25 days at a stretch. Echoing this, those affected by the landslide in Aranayake highlighted that roads were blocked due to the landslide, preventing their children from going to school. In contrast, respondents who had faced sea level rise-related flooding indicated how part of the road gets inundated, resulting in children not being able to attend school. In the absence of alternative coping strategies when faced with education accessibility issues, these left behind children were compelled to resort to the coping strategy of missing school. This shows that to minimize the impact of flooding, landslides and sea level rise-related flooding on children's education much attention must be paid to ensuring access to education during climate hazards. Some approaches to consider include providing transportation to and from school and or clearing affected access ways to schools as a priority. An example of such a coping mechanism was explained during the FGD in Bulathsingala. At one time, the flooding had been amid O/L examinations and there had been 5 children sitting the exam. During this instance, the community got together and tied the two canoes together, put a deck on top and transported these students for about 2km from their homes to the examination center. Additionally, as highlighted during this KII, the disruption to power due to heavy rain and flooding also affects students' education. Further nuances of coping strategies under the theme of education that affect children were revealed during the FGD in Bulathsingala. Specifically, discussants in the FGD highlighted how the frequent flooding makes it difficult to retain teachers in schools in this area, contributing to the deterioration of educational quality. However, other than students adjusting to the level of education offered, no other coping strategy is available. Nevertheless, some possible strategies would be to provide a financial incentive for teachers working in such areas or ensure that adequate teachers from the neighboring area are posted to schools in the affected areas.

With regards to the quality of life and related coping mechanisms, a respondent in Aranayake highlighted how the unhygienic conditions in the relocated areas, such as piled up garbage, odor from toilets/septic tanks and breeding of flies adversely affect children. On top of this, they had to consume their food surrounded by foul smells and flies. Moreover, respondents in Karaitivu that were exposed to sea level rise indicated that when their income is compromised due to sea level rise, they adopt food coping mechanisms and their children forego meals. Highlighting the fear factor among children, one HH KII respondent in Nawalapitiya reflected on how children were traumatized by the falling of rocks and related damages to houses during landslides in the area. Similarly, in Karaitivu, children get scared of the sound during heavy rain and strong winds. At the same time, when seawater floods inland due to sea level rise in Karaitivu children are traumatized as they tend to relate such events to the catastrophic Tsunami of 2004. Specifically, as mentioned during a HH KII in Karaitivu, "from time to time, the sea comes into the village" and this year, the extent is much more than last year. As such, this respondent reflected that "when seeking refuge in the kovil there. The children ask why it is different from the previous time. We feel scared". This parent further highlighted how children do not want to be there now, due to fear of losing their parents like many did due to the Tsunami in 2004. Apart from fear, a HH KII in Karaitivu indicated how the father's injury during fishing at a time of a storm/lightning and related hospitalization affected the daughter. Specifically, this child has been studying for the fifth grade scholarship exam. When the father was hospitalized, the child lost all focus and concentration on studies. A common coping strategy adopted towards their children's quality of life is staying in touch with those who migrated. A coping strategy adopted in the context of a Trincomalee KII respondent's left behind children is calling the father daily over the phone. This ensures that the father and the left behind children can stay connected and well-informed about each other despite migration due to climate exposure. The same strategy of daily phone calls was echoed in the case of drought-affected income loss-related migrants, as revealed in the FGD in Anuradhapura.

However, neither quantitative nor qualitative data provided information about psychological support provided to children as a coping mechanism. However, as revealed by a HH KII respondent affected by sea level rise in Thalalla, an NGO provides a great service to young children. The respondent mother highlighted in this regard that "our children are completely taken care of by them. So, we put them there since it is free and I work". This reflects those coping mechanisms for psychological support and for general wellbeing is an important aspect that needs further improvement. Perhaps such support can be provided through the education system with the financial and technical support of NGOs or international organizations.

Another theme regarding coping strategies in the case of left behind children is their safety. As noted by a HH KII respondent in Thalalla, her husband has migrated due to a decline in agricultural income due to sea level rise-related flooding while she earns an additional income by working in the night as a hired worker. During such times this mother highlights that her three children close the doors and stay home by themselves. This reflects that these families adopt a coping mechanism where children take on responsibility for their own safety.

On the contrary, a HH KII in Thanamalwila identified that due to low income from agriculture during drought, she wished to work as a laborer, but concerned with her daughter's safety, this woman did not pursue such employment avenues. The same respondent also noted that she is worried about what would happen to her children if she or her husband died due to an elephant attack.

Another theme emerging in coping mechanisms is the prioritized evacuation of children. In the case of flood-affected HHs, a HH KII in Elapatha parents noted that since the children in the HH could not swim, their children were sent to their sister's house for safety during flooding. At the same time, the parents endure the floods by staying in the make-shift upper level made of planks to protect their belongings, resulting in parents and children being separated during flood-related displacement. This scenario was also evident in HH KIIs in Henamulla, Colombo, where one respondent mentioned sending the children along with all their clothes to her sister's house and she remained at home during flooding. This respondent had cooked meals for the children at her flooded home and taken to her sister's house and also taken the children to school from there. A similar scenario was also reflected in sea level rise-affected areas. However, here, parents fled with their children. For instance, a HH KII respondent in Karaitivu highlighted how when the alerts for evacuation are issued at night, they just leave everything else and carry the children and run to safe locations. These examples reflect the coping strategy of the prioritized evacuation of children within families at the HH level. A HH KII respondent in Thalalla further revealed similar prioritized evacuation of children at the community level. She underscored how children are given priority in the evacuation during sea level rise-related flooding.

Another theme regarding coping strategies for left-behind children is their taking on HH level responsibility. A HH KII respondent in Thalalla highlighted that she gets to prepare meals only once she returns after work. As such, at times, her elder daughter prepares some food for the siblings. This reflects that children affected by climate disasters are prompted from an early age to take on more HH responsibility. This was further echoed during KIIs in Bulathsingala, where it was highlighted, that children help adults to clean the house after flooding before turning home from displacement locations. Reflecting yet another nuance of children's involvement in HH activities, a seasonal migrant that had migrated to Trincomalee highlighted how his migration was a family level decision and that his children, too, liked this idea. It is interesting to note how the consensus of children was also sought before outmigration due to climate exposure.

Amidst such rich information on children's coping strategies emerging from qualitative data, in the quantitative data from the HH survey, the level of reporting of coping strategies by the 379 households with left behind children is very low. For instance, despite rich community level coping strategies as well as support from neighbours, friends and relatives, as discussed above based on qualitative data, the number of HHs that reported these was very low in quantitative data. Nevertheless, a relatively more common strategy across all types of climate disasters was seeking help from friends/relatives. Other identified strategies included seeking community support and reliance on relief items and scholarships. This shallow reporting of coping strategies in the closed-ended quantitative survey, as opposed to rich information emerging from open-ended qualitative interviews and discussions, underscores the limitations among those affected by climate events and migration to identify the measures they adopt as "coping strategies".<sup>21</sup> As experienced during qualitative data collection, a high level of probing was needed to ensure that respondents provided the required information about coping strategies. This underscored the lack of awareness among respondents that the regular actions/activities they perform when faced with climate events and related mobility are indeed coping strategies. Perhaps the respondents' failure to identify these as coping strategies (without probing questions from interviewers) is because these activities have become routine and part of the respondents' lives. As such, they cease to see these as something that only those affected by climate change adaptation. This gap in providing information for closed-ended versus open-ended questions in the quantitative versus qualitative data collection, respectively, is itself evidence of the need to improve more formalized support and awareness of same.

<sup>21</sup> Such low reporting of coping strategies in quantitative data cease to warrant the validity to perform any further quantitative analysis of coping strategies.



Photo 4 - 1 : Floods in Gampaha  
Source: Authors

#### 4.2.2 Women and women household heads

During climate change events and the mobility of a family member, women have been involved in various roles, from mother to caregiver elders to HHH. These experiences emerging from qualitative data can be broadly categorized into a few key themes. These themes include income, health, safety, social/cultural relationships, accessibility and quality of life-related coping strategies, as discussed in the next sections.

Regarding income-related coping strategies of left behind women, one of the main strategies is to continue the income earning activity they employed before migration. This was seen even in the absence of a HH member due to migration. As highlighted in the case of HH KII in Thanamalwila, after her husband migrated, this left behind woman continued in the family agricultural activities. In doing so, women sometimes assume the role of the HHH and make all HH income and related decisions. Similar added responsibility associated with maintaining the flow of HH income is reflected in the experiences of female HH KII respondents in Thalalla, that faced salinity and sea level rise issues when the rising of the estuary affected their farm. As indicated by this woman, swift action is needed in such situations. If the seawater retains around the paddy plant for over a day, it will ruin the entire crop. Based on her experience, this woman highlighted that “the coast conservation department thinks we are digging the estuary for private reasons and they would block it”. Moreover, “when we call, they say today our miss is not there, so we will push it for tomorrow. Then another person commented on another aspect. Then we are delayed by 2 or 3 days”. As these sorts of delays cannot be accommodated, with their interest to save their livelihood, the coping strategy adopted by this woman is to join others in her community and get involved in manually digging the estuary until the water can flow away to the ocean. As explained by her, this coping strategy involves digging the estuary for a long time, nearly the whole day. The task is explained as a tedious one that must be done continuously in the hot sun, making one very tired and thirsty. At the community level, this woman and others organize and provide all food and refreshments to those digging the estuary. At times when the estuary rising is too wide to be cut manually, then the left behind women together with others pool money and bring a backhoe as a coping strategy. Moreover, to minimize the impact of salinity in paddy crops, as highlighted by this woman, she and her other community members brought students’ benches from the temple. They kept them in the field so that they could cut the harvest onto these benches. Moreover, after harvesting, they kept it on their heads and took it away. Additionally, as a left behind woman farmer, the respondent in the HH KII in Thalalla mentioned how she tried planting salinity-resistant seed varieties. Additionally, this woman has started growing vegetables to boost their HH income on top of her husband’s income from migration.

This woman’s experiences reflect how a left behind woman makes income-related decisions as a HHH and works collaboratively with her community members to solve her income-related issues in the absence of her migrant husband and earn a sufficient HH income.

However, qualitative data reflected that when faced with crop failures due to adverse climate events, many left-behind families faced difficulties in ensuring food security for the left-behind HH member despite human mobility and related remittances. As repeatedly seen in qualitative data across various climate events and geographic regions, seemingly, always the burden of providing food to the family often falls on left behind female HH members. In the case of Thanamalwila, a left behind woman affected by drought highlighted that when faced with crop failure due to drought and related decline in income, despite mobility, the left behind female HH member purchased goods – mainly food items, on credit from local shops. Reflecting another dimension of ensuring food security for the left behind family members, a respondent in HH KIs in Aranayake highlighted how the women had to manage with the relief bags provided during the aftermath of the landslide. Additionally, as noted by this respondent, some women borrow money from friends. Another respondent indicated they too borrowed from *Marana Adhara Samithiya* (funeral assistance society) in the village. Both these incomes related coping strategies of purchasing food items on credit and borrowing money to buy food items involve repaying at the end of the month, mainly through remittance income. Interestingly, remittances were not directly identified as an income-related coping strategy but only through other coping strategies.

Another very commonly noted income-related coping strategy adopted by left behind women is reliance on the government social safety net Samurdhi. The importance of Samurdhi as an income coping mechanism emerged from qualitative data collected throughout all 15 districts. However, some KIs revealed various issues in this government subsidy programme and its implication of women and women HHHs. As highlighted by a HH KI respondent in Thanamalwila, these payments have become irregular, while deductions have been non-transparent in recent months. As noted by this respondent, while she has been entitled to a monthly Samurdhi subsidy LKR 3500, a sum of LKR 500 was deducted for unknown reasons and only LKR 3000 was paid. In the case of flood-affected houses in Elapatha, it was revealed that since the son had a job, they were not eligible for Samurdhi. This reflects that having a migrant from the family can also make the left behind women ineligible for Samurdhi benefits.

Pawning their jewelry is another income-related coping strategy adopted by left behind females. A HH KI in Elapatha affected by floods also highlighted the importance of pawning jewelry and assets as a coping strategy in the aftermath of floods, while a HH KI in Thanamalwila reflected on her experiences during the COVID-19 pandemic where her husband could not travel for migratory work due to travel restrictions and she pawned her necklace for LKR 25,000.

Another key theme emerging among left behind females is health-related coping strategies. A careful analysis of these health-related coping strategies reflects interesting nuances in terms of its interlink with HH income, prioritization for health care for left behind HH members and how it impacts women's health. One common theme emerging from qualitative data across all climate events was that adult women have voluntarily opted to forego their medical treatment or testing. For instance, as noted during the HH KI in Thanamalwila, "it has been almost a month now without [my] medicine. We are unable to go. I want to go to Pannamure, but I didn't go for a month because I don't have money for medicine and x-ray". The same coping strategy was evident in HH KIs in Horowpathana where adult women delayed medical treatment and testing.

Nevertheless, even though the left behind adult women's medical treatments is often foregone as a coping mechanism, these left behind women as HHH strive to ensure medical attention for their children. For instance, the respondent in Thanamalwila who delayed her medicine and x-ray ensured that her husband returned home from his temporary migrant job, if and when the children got an asthma attack. This reflects the high priority given by women to their children's health while neglecting their own health. Moreover, this coping strategy also reflects how the left behind mother ensures that she gets the support of the migrant father to deal with children's health issues. Such cases of returning of migrant men were not evident in qualitative data when an adult woman was dealing with a health issue or neglected to get treatment for herself. This reflects that left behind women's health is likely to go largely unnoticed and neglected as often. The reason is there is no other adult to alert the woman or the rest of family members (including the migrant) of the need to receive medical attention for women unless the left behind women themselves bring it to the notice of others.

In addition to seeking support from the rest of the family for children's health concerns, qualitative data highlights how women handle their financial constraints for medical attention of their children by borrowing money. For similar financial constraints with regards to medical treatment for women, borrowing money was not a common strategy. The dedication of left behind women towards medical attention for their children is further highlighted by the fact that the respondent in HH KI in Thanamalwila informed her about her two asthmatic children to the A.G office in the area. Here the A.G office informed that they would provide an LKR 350 payment for both children. However, the left

behind women had refused this offer as she “thought that if I get that, I will lose my Samurdhi subsidies”. This reflects the lack of clarity about government support-related coping strategies for left behind individuals.

Another key theme emerging from left behind women is their concerns about their safety as well as that of the left behind family. Often when the husband migrates, the women take on the role of the HHH and have to make day-to-day decisions about the safety of the HH members. As highlighted by a respondent in a HH KII in Thanamalwila, “even now I’m afraid when appachchi [children’s father] is not at home. Because my daughter and I are there. If the son would have been there, then nothing to fear”. Here a simple coping mechanism adopted according to the respondents is, “since my son is not there, we close the door in the evening”. Another dimension of fear among left behind women stems from their indebtedness. For instance, a HH KII in Thanamalwila highlighted how they live in fear when they cannot repay the loan instalments on time. As noted, “I stay at home with fear that creditors will come”. In addition to closing the door and staying at home, this woman indicated that she avoids going out or to places where it is likely to cross paths with the creditor. For instance, this woman indicated that “sometimes, I don’t go to the shop, I stay at home”.

When faced with floods, as indicated in a HH KII in Elapatha, the left behind woman along with her husband spent the night and the following day on top their roof to protect their belongings. This woman, with her husband, has moved some belongings to the roof and tied them with ropes to secure them. As mentioned, “if they are washed away, we are at a loss. So, we are staying on the roof top”. Here the coping strategies adopted included supporting her husband in protecting their belongings and foregoing meals and water as they had to ascend to the roof in a rush without taking necessary supplies for their sustenance. Moreover, when relief items were distributed, this woman had to stay back and forego them as she could not go to such places.

On a different dimension of safety, many respondents to qualitative data collection indicated how women prioritized sending their children to the safest place while they remained at home to protect their belongings. As revealed during a KII in Henemulla, one woman sent her children to the safety of her sister’s house. She continued elaborating on how she sent the children along with their clothes and schoolbooks while staying home. As such, she cooked at her own house, took food to the children and then went to school from her sister’s house. As emerging from the experience of this respondent in Henemulla, when children were sent to places of safety, women had to coordinate activities across two houses. Similarly, the above respondent from Elapatha also had sent her children to her sister’s house due to safety reasons, while she stayed back with her husband on the roof top to protect their belongings.

Reflecting yet another dimension of safety prioritized by women, a HH KII in Walapane reflected how she was first exposed to a landslide, she was with her newborn daughter of 15 days. As she could not take the baby to safety herself, she sought help from a neighbouring older woman and took the baby to the shelter at the temple. However, thereafter, even during landslides, she refrains from going to such shelters and continues to live in her home even while her neighbours evacuate to shelters because it is difficult to be displaced with infants/kids. As such, knowing the danger, she continues to stay at home.

Further difficulties faced by women during displacement were revealed in qualitative data. For instance, one HH KII respondent highlighted how they had to go from their house to another for safety and when that house was also flooded, they had to be displaced to the temple. Similarly, one woman from Walapane reflected on how she had to run with her daughter and husband to brother-in-law’s house, “because there was a huge crowd in the temple on that day”. Such repeated displacement and its chaotic and unplanned nature place considerable stress on women as they feel insecure even after reaching a shelter. Nevertheless, some women have well-planned coping strategies, where they pack essential documents in a bag to take with them when evacuating. Some just grab and prioritise what to take at that time. “It was impossible to take anything from home. She only took the children’s birth certificates”.

The analysis of left behind women also highlights coping strategies in terms of accessibility. For instance, in the case of the respondent in Thanamalwila, the banks and health facilities being located far, making it difficult to reach them. As underscored by this respondent, “there is a school here for education. It’s the only facility which can be easily accessible. Everything else is difficult and we have to go about 12km to reach other facilities”.



One dimension of these accessibility issues stems from transportation issues, as only a few buses run in this area. Additionally, the current fuel crisis has aggravated these transport issues, as now there are fewer buses than usual, while at the time of the interview, restrictions were imposed where the mobility of people was limited only to essential services. Another dimension of these accessibility issues stems from the costs involved. As highlighted during the HH KII in Thanamalwila, “it used to cost us LKR 40 to go to the town, but now it costs LKR 100. We have to consider how to earn LKR 100.” In addition to the financial cost, these left behind women are also concerned about the opportunity cost of accessibility. Specifically, “if it used to take half a day to get to town, now it takes about a day with the problem of fewer buses”. These issues are further compounded by hospital delays as “if it takes a long time at the hospital, we will not be able to catch the bus”. When faced with these issues, some coping strategies that emerged from analysis is the priority-based avoidance of accessing services/facilities, or borrowing money to access, as discussed under the health theme.

In the case of HHs affected by landslides, accessibility was affected due to debris falling on access roads. A respondent to a HH KII in Aranayake highlighted how roads were blocked due to landslides affecting getting to the hospital. Similar issues due to floods were also highlighted. These aspects were discussed in detail in the previous section from the children’s point of view.

The qualitative analysis also highlights coping mechanisms adopted by left behind women with regard to their quality of life. One issue affecting the quality of life among those facing drought is water availability. In the case of HH KII in Thanamalwila, it was revealed that the coping strategy was resorting to water being provided by bowsters coordinated through the divisional secretariate offices. This affects women’s HH activities in terms of cooking, washing and bathing, to name a few. Additionally, women displaced in areas of Aranayake reflected how they had to manage the wellbeing of their family members with the relief bags with dry ration, clothing, sanitary products and medicine provided at displacement camps. As explained by one respondent, tents were provided by the IOM, while other supplies were provided by organizations such as the Red Cross. These women had to cook in their tents using the dry rations provided. Moreover, some landslide victims experienced staying in shelters for an extended period. As in the case of a HH KII in Aranayake, when the landslide had happened, they had stayed in tents for about a year and a half. For such HHs that stayed for extended periods, dry rations were provided once a month, while the other goods were bought at their expense. Living in tents for an extended period creates added difficulties for women. As noted by many respondents in flood-affected areas, once the flood had receded, this left behind women involved in cleaning their homes before bringing their families from places of displacement.

The analysis of coping mechanisms adopted by left behind females also reflects socio-cultural dimensions. As highlighted by the HH KII in Thanamalwila, if the left behind female or the family could not attend an event in their community such as funerals, weddings or almsgivings, then such families would not attend similar events of the left behind family. Due to this expected reciprocity, the coping mechanism adopted by the left behind women is to participate in such activities as much as possible so that they are assured of community support in case they face a similar situation, often in the absence of their husbands due to migration. Reflecting similar socio-cultural reciprocity expected from women, the respondents to a HH KII in Elapatha elaborated on their deep mutual understanding with their neighbours, where women help each other in need. For instance, those who displace to the homes of neighbours and friends have helped the latter in times of their need, such as during sickness, grief and so on. Notwithstanding the coping mechanisms, this emphasises the significance of the social relationship, which acts as a pull factor for mobility.

In the case of a flood-affected female, it was apparent how a culturally important album was destroyed in the flooding. This album contained photos taken at the celebration of the HH KII respondent’s daughter’s attending of age celebration and the cost of preparing this album was LKR 35,000. As highlighted by this woman, “because those are memories that will not come again. That was the biggest loss for me”. As such, once it was destroyed by the floods, the coping strategy adopted by this woman was to spend money and effort to make another similar album.

As highlighted by the HH KII respondent, left behind woman performs a dual gender role. Where she rides a motor bike and transports her children for various activities. As she explained, “I take her in the bike in the morning. The two younger sisters are also dropped off at school, so all three are done at the same time”. In addition to transporting her children, this woman also works in the field. “Then I come home and go to the paddy field for work. Then I bring them back home and then take them for any classes they have and bring them back. So that is my job. Husband only earns”.

Similarly, as indicated in a HH KII in Horowpathana, when the husband leaves for migratory employment in other areas, the left behind wife takes on all family responsibilities. As noted here, the elderly mother-in-law in this HH is paralyzed and cannot stand up or care for herself. As such, the left behind woman assumes the role of the HHH and does most of the work for the mother-in-law and the children left behind.

Older women helping younger women was another theme emerging from qualitative data. As noted previously, an older woman helped a young mother of a 15 day old baby to move to a shelter at the time of the climate event. In addition to helping during climate events, another aspect of such help is in terms of livelihood options and prioritization among women in the HH. Many instances were reported where older women help with childcare activities of left behind women. An older woman from HH KII in Aranayake mentioned how she went to work in a factory because her daughter didn't have a job at that time. She mentioned, "I asked her to stay home and I went to work". She also highlighted how her daughter could not "go anywhere leaving babies alone". As such, after her daughter had found a job, this older woman had given up her job to stay at home and take care of the grandchildren.

As seen above, some of these coping strategies are not explicit from respondents' point of view. Rather, these are part of their life where they compromise/forego something or carry on with the best they can do under the circumstances, such as foregoing medical treatment or giving up a job to employ a younger woman. As such, the analysis brings out the challenges/limitations in the capacity of respondents to identify their behaviour as specific coping strategies to the issues they have faced.



Photo 4- 2 : Impact of Sea Erosion in Mundalam, Puttalam.

Source: Authors

### 4.2.3 Elderly

The exposure to various climate events and having a migrant from home have necessitated elderly individuals to adopt numerous coping mechanisms. The key themes in terms of coping strategies are health, community level support, income and livelihood, as discussed below.

One theme emerging from qualitative data concerning the elderly involves their health situation. These include access to health concerns and medicine during displacement. For instance, as emphasized by a HH KII respondent in Aranayake, the respondent's elderly father had already been on medication for a pre-existing health condition. As such, they did not want to take him to a shelter at the displacement point but decided to send him to the respondent's son's house. While being away from his home and usual HH members, this elderly person has missed his usual lifestyle and his health condition has deteriorated. As underscored by the respondent, "so, he wanted to return home. So, he went" home. However, the aggravated health condition resulted in this elderly person passing away after three months of the said displacement. Similarly, in Aranayake, an elderly person had been living alone and chose not to seek displacement shelter. The neighbours had been helpful and had been looking into his welfare.



Access to medication during displacement was also a concern for elderly persons, as they could not go to their regular clinics and so on, while being in temporary shelters. However, the existing mechanism of providing medication for one month benefited many elders as they had the necessary medication for a few more weeks at the time of displacement. For instance, as underscored by a respondent during a HH KII in Aranayake, there were some medicines that her father regularly takes. But they had the required medicine at hand “because his medicines are usually brought for a month”. As emphasized by a landslide affected displaced respondents from Walapane, the health of the elders in their displacement camp was taken care of by a team of doctors from the nearby hospital. This team of doctors visited the temple where their displacement center was located and provided medicine there.

Additionally, elderly persons have limitations in accessing displacement shelters. One example from Aranayake involves an elderly person who was paralyzed and could not walk. As reported by his daughter, at the time of displacement, the family members had to carry him. As depicted by the family members during a HH KII in Aranayake, “it was very hard to carry also” because soil, rocks and parts of mountains were everywhere on the roads and the roads were also damaged. As such, finally, the family had finally managed to find a three-wheeler to transport this elderly person.

Similarly, an elderly couple in Walapane highlighted that when it rains heavily or if it is night, the elderly persons cannot go to a displacement shelter as walking during such extreme weather conditions is not safe. This couple elaborated that they “can’t even go there if it is late. So, we eat what we have and sleep. Then it rains so heavily. But whatever happens, we stay. There are times we are scared”. However, as mentioned by them, staying back is also equally unsafe. They further emphasized that they feel less scared when they are with the rest of their community in the displacement center at the village temple. As narrated by this couple, when they feel that the risk of staying at home is greater, there have been “instances of us going in the night also. When it is raining a lot and we had to run to the temple”.

Another theme in terms of coping emerging from qualitative data is the community level support extended towards the elderly, which emphasises instances where social capital act as a coping mechanism to cater for the migration. As highlighted in Walapane, if any support is needed, the elderly can call anyone in their community and they would willingly come and help. As explained by an elderly respondent, some young boys in the village came and helped fix his collapsed roof. Moreover, community level societies such as the Samurdhi society are another source of support for the elderly. As explained by one elderly respondent, when an elderly person informs the Samurdhi society that they need support for a certain activity, then some society members would come along and help the elderly.

Another main theme in terms of coping mechanisms of the elderly is in terms of income and livelihoods. To manage their income and expenditure, many elderly respondents rely on Samurdhi and elderly payments provided by the government. However, as in the case of women discussed above as recent recipients, they experienced issues regarding the inconsistency of the amount provided. One elderly respondent highlighted that “now even Samurdhi you do not get every month”. Moreover, the “previously received LKR 1500 is largely cut off now. Then you only get about LKR 1000.” However, the same respondent highlighted that that was earlier and “now they must have increased. I got LKR 4000 last time”. Confirming the previous finding discussed under women shows the very limited understanding of the Samurdhi recipients about their entitlement, why and when deductions are made and the amount if increased.

Apart from relying on government safety nets for their income, some elderly continues to involve in their livelihoods. These include working in their paddy fields and seeking similar livelihoods as paid labourers. Moreover, some are involved in working on agricultural land owned by others. Here, the arrangement is that a portion of the harvest goes to the landowner. An elderly HH KII respondent from Walapane emphasized these livelihood strategies.



Photo 4- 3 : Elderly Person from Walapane, Nuwaraeliya.  
Source: Authors

Case Study: Household left behind.

#### Story of Mrs. Shiromi Kumari

Mrs. Shiromi Kumari is from the Suhadagama GN division in the Horowpathana division of the Anuradhapura district in the North Central Province of Sri Lanka. This area falls under the dry zone of Sri Lanka. In contrast, the main livelihood of many people is agriculture/farming, which continues in two periods of Yala (May to August) and Maha (September to March).

Ms. Shiromi is originally from Homagama and moved to the village [Suhadagama] after her marriage. This 40 year old is a mother of five children: one daughter and four sons. Her eldest daughter is 20 years in age now and has been selected to the university. Among the boys, the eldest is 18 years old, followed by twins in grade 10. The youngest is 4 years old and attending pre-school. Ms. Shiromi is currently engaged in farming as her main source of income since her husband has been out of the village for 4 years. She owns a 1 acre paddy field, one and half acre of chena and half acre of home garden.

Normally from August to September of every year, the area is exposed to droughts, which leads to reduced crop yields and loss of harvests, where most people become indebted due to destabilized livelihoods. As mentioned by Ms. Shiromi, “during the periods of drought, farming is completely destroyed” this often leads to many problems as, generally, farming is carried out on borrowed funds. For instance, seeds for farming are purchased by either pawning assets or obtaining agrarian loans, “vaga naya” from banks with the expectation of repaying after harvesting. When drought affects their crop, difficulty repaying these loans leads to high indebtedness in her community. For example, Ms. Shiromi notes that “vaga naya” needs to be repaid within six months, which becomes challenging during drought. Moreover, she highlighted that crop losses “are supposed to get some benefits, but still we haven’t received”.

Due to these concerns, most of the men in the village [mainly HHHs] tend to migrate to other areas looking for other employment opportunities in places like construction sites, security firms and companies and so on. In 2017, her husband also decided to migrate to another area in search of a job. This was mainly due to insufficient income from the paddy fields and the need to settle some loans already incurred, which were unlikely to be repaid with farming earnings. These issues were aggravated by the financial demands of raising five children. As such, in 2017, Ms. Shiromi’s husband migrated to Trincomalee for a security job at Prima Company for a monthly salary of LKR 25,000.

Her husband’s security job in the Prima Company included food and lodging provided by the employer. While employed in Trincomalee, he came home once a month for 6-7 days of leave. Subsequent to working there for around 9 months, in 2018, he decided to migrate to Qatar for a security job. For migration purposes, they (migrants) had to incur a bank loan and pawn their assets. As noted by Ms. Shiromi, her husband “got a loan from Ceylinco” and they “had to pawn everything, including the paddy field.” At the time of speaking,

her husband sends her a monthly remittance of LKR 40,000.00. With these remittances, she could repay all the loans incurred for her husband's migration and only needed to repay and recover some pawned jewelry. Additionally, she has also been able to save some money from the remittances.

While her husband was away, Ms. Shiromi managed all children, HH activities and farming, also with her children's support. This resulted in Ms. Shiromi transitioning to the HHH. In addition to becoming the HHH, Ms. Shiromi had to take on both parental and gender roles in continuing farming activities, feeding her children, taking them to school and looking after her children. This emphasises the change in family relations and the burden caused on left behind women due to extended drought and uncertainty. During the COVID-19 pandemic, in some months, her husband could not remit and she had to struggle a lot to meet ends to feed her children. This necessitated her to go for a daily paid job and continue activities on her farm with the support of her sons. Also, she runs a self-employment business making bags to earn additional income. During this time, she had also been involved in crop planting smes. Highlighting the financial challenges of continuing farming, Ms. Shiromi noted that paying hired workers at the end of the workday is difficult. As a solution, she partakes in "attam" activities, where the community shares each other's labour to work the fields.

However, she could survive and feed her children with the home-grown vegetables and paddy produced in her own fields. She further stated that she no longer sells her paddy harvest. Moreover, she underscored that "if needed, I'll even get a loan and repay. Because if you have rice, at least you will eat. Now even if you have money, you can't find good rice. So, when I keep the rice, I can somehow feed them [children]". This highlights how migration and livelihood changes during the drought have ensured food security for Ms. Shiromi's HH.

Apart from drought, the village in which Ms. Shiromi and her family live is frequently attacked by wild elephants. Hence, they are also exposed to such events. As she mentioned, "Yes, they [elephants] come in. Recently they came even when the children were here. So, we are very scared. Can't even store paddy harvest in our home. Because we never know when these elephants come." So likewise, she and her family live with the frequent threat of wild elephant attacks. Thus, the direct and indirect negative impact of climate change has caused more responsibilities, such as ensuring the safety of children, on female HHHs like Shiromi.

Notwithstanding, Ms. Shiromi is a courageous and hard-working woman in the village who engages in several other community led activities as well. She is currently the secretary of the farmer's society and an active member of several other societies in the village. She maintains a good relationship with all families in the village. Such social connection with the community ensures that her life as a left behind woman and her HH as a woman HHH are stable and well protected. Her intention is to somehow feed and educate all her five children. As she stated, "We do anything to send them [children] to school".

### 4.3 SUMMARY

This chapter deals with vulnerable groups in their experience in mobility due to climate events and their coping strategies when left behind.

When faced with climate events and human mobility, HHs face various implications. This chapter finds that all types of climate disasters negatively affect HH income and livelihood opportunities. However, the impact on income is mostly reported by drought affected HHs, while the impact on livelihoods was reported by rain/flood affected HH. To cope with all types of climate disasters, HHs adopt various strategies across all four phases of climate disaster. At the same time, this chapter finds that the most popular strategies are micro level solutions within the HH and its connections. The importance of relief payments or support by the government or other donors is relatively low in quantitative data. Simultaneously, the sale and pawning of HH assets and borrowing money (microfinance institutions or relatives) using previous savings are notable recovery measures. Only a few have acknowledged migration and related remittances as a coping mechanism in either of the four phases of climate disaster. Changes to livelihoods and agriculture practices such as changing the crop type cultivated, cultivating only one season and cultivating salinity resistant varieties, were more prominent strategies in mitigating the effect of drought by HHs.

While reporting coping strategies was low in the quantitative data, the qualitative analysis in this chapter reflects rich nuances of coping mechanisms adopted by vulnerable groups such as children, elderly and women and female headed HHs. The prominent children-specific coping strategies are discussed under themes of education, quality of life, safety and HH level responsibility. The analysis reveals that the absence of coping mechanism related to social safety nets, especially for slow onset disasters and extreme weather events, adversely affect children's education. It mainly affected their HH income and ultimately resulted in dropping the children's education. To ensure children's education has a minimal impact from climate events, some suggestions emerging from the analysis include: considering providing school transportation during climate disasters, replacement of text books, giving priority for clearing school access roads in climate-affected areas and providing financial incentives for teachers working in disaster areas or posting local teachers from the vulnerable areas to improve their retention. The study finds no evidence of psychological support as a recovery measure for children during climate disasters, despite the distress, they endure. As such, it is important to introduce such aspects to existing support mechanisms in disaster management.

This chapter finds that women and women HHHs play a huge role in left behind HHs. One key aspect of women's coping strategies is income earning and livelihood throughout all four phases of climate disaster. Some related strategies adopted by left behind women include; working collaboratively with the community during resilience building and preparedness phases, borrowing money to be repaid with remittances during recovery phase, reliance on the government social safety net and foregoing medical attention to prioritize same for other HH members during response phase, drawing on the synergies of older and younger women, maintaining social ties and in general, performing a dual gender role during multiple phases of climate disaster.

The analysis of coping strategies of the elderly is discussed under the key themes of health, community level support, income and livelihood. Some strategies adopted by the elderly for disaster preparedness include harnessing the community's support, especially for younger individuals and at the community level. For income, elders rely on Samurdhi and elderly payments provided by the government or continue to involve in their livelihoods. However, elders often face challenges when accessing displacement during climate events and medication and treatment while displaced. Here, the provision of a monthly supply of medicines by government clinics benefited many elders.

Overall, this chapter finds a gap in those affected by climate disasters adopting various coping strategies and their capacity to identify the same coping strategies. Similarly, despite migration and related remittances contributing towards HH income and livelihood options, the importance of migration and remittances in the context of coping strategies for climate events is not fully comprehended. These gaps are likely due to these coping strategies becoming a routine part of their lives. These highlight the need to improve awareness among those affected by climate disasters about alternative coping strategies and the need for a disaster preparedness plan. It is better to support them by utilising the available coping strategies to their full potential. Most importantly, they need to change their mindset to become willing to adopt new coping strategies that they currently may not consider as a coping strategy.

## 5. SLOW ONSET AND EXTREME EVENTS AND MOBILITY

Climate events have varied implications for human mobility. While floods and landslides immediately lead to temporary types of mobility and subsequently, to more permanent solutions, extreme events like drought and slow onset events such as sea level rise lead to more temporary solutions through mobility. This chapter focuses on sea level rise and drought and their interlink with seasonal and temporary migration based on qualitative data to address the fourth research question (RQ4).<sup>22</sup> The discussion initially focuses on drought, followed by issues related to sea-level rise and the seasonal migration of fishermen. Unlike flooding and landslide-related mobility, migration related to drought and sea level rise is not clear cut. Their push towards migration does not have an obvious timeline and the mechanisms at play are complex and are often generated through the absence of livelihood options.

### 5.1 DROUGHT AND MIGRATION

Temporary or seasonal migration could be identified as one of the responsive strategies most HHs adopt. In most cases, migration is the last option, where people look for other alternatives within their areas and finally consider migration. Given these concerns, this section discusses push and pull factors leading to migration, followed by a discussion of the impacts of drought and related migration on HHs left behind (including specific vulnerable groups). Subsequently, the coping strategies for drought and migration adopted by HHs are discussed.

#### 5.1.1 Push and Pull Factors of Migration

As evident from the qualitative data and desk research, droughts act as drivers of migration from rural to urban areas or other areas as a temporary or seasonal migrants. Such migration is mainly attributed due to several reasons, including declining crop yields, livestock or water availability, increased cost of agricultural inputs such as seeds, fertilizers and pesticides, decreased income for farmers and indebtedness, to name a few.

##### *Declining Crop Yields and Lack of Water Availability*

As evident from qualitative data, mainly severe droughts and erratic rainfall patterns in the dry zone led to a lack of water availability for agricultural purposes, which resulted in lower yields of paddy, vegetables and other field crops. Such declining crop yields were repeatedly mentioned in several KIs conducted in drought prevalent areas such as Hambantota, Monaragala and Anuradhapura. For instance, as mentioned during a HH KI held in Thanamalwila, “this time, sesame was sown in that land. But they have not grown well due to drought. No yield. Only the plants are here. It’s in the same land where the mung beans were sown and the yield did not grow. You can see only the plants here.” Similarly, this has been validated by one *Apadha Sahana Niladhari* (ASN) officer in Thanamalwila DS division, as “due to lack of water during the drought seasons, farming activities cannot be carried out and production collapsed”. As highlighted in the FGD conducted in Horowpathana, the situation has further deteriorated due to non-maintenance of tanks or cascade systems in most villages in the dry zone, which farmers rely on during the Yala season when rainwater is scarce. Thus, as evident from several qualitative interviews conducted in Horowpathana, many farmers cultivate only during the Maha season (using rainfed water). In the Yala season, most of them have to abandon their lands and look for other income opportunities, such as temporary or seasonal migration to nearby cities to work in construction sites, security firms and garment factories within and out of their villages. A GN officer in Horowpathana validated this HH level information as “during the drought season, people who normally cultivate their field during both seasons are compelled to cultivate only during the Maha season”. As evident from the data collected, this situation has become a common scenario in most of the districts in the dry zone, including Anuradhapura, Monaragala and Hambantota.

Apart from this impact on agriculture-related livelihoods, the depletion of water available for drinking and other purposes also acts as a common lifestyle problem for most people in these dry zone areas. For instance, as stated by an ASN officer in the Thanamalwila DS division “people face drinking water problems due to the continuation of the dry period of about six months”.

<sup>22</sup> RQ4: What is the specific impact of drought and sea level rise/ sea erosion/salinity on migration ?



The persistent drought leads to the shortage of water for other purposes, such as bathing, washing and cooking as well as for their animal's needs. These non-agriculture requirements are met from water sources such as lakes and tube wells. As highlighted by this ASN Officer, "when there are about six months of the dry season, the water level even in *Kirindi Oya* decreases to the minimum. Then people dig wells in the middle of the river to get water". He further highlighted that when people tend to use other water resources like wells or tube wells for drinking, cooking and washing purposes, some experienced several health issues, including kidney problems and chloride issues. Similar issues were highlighted in one KII with an official, where the decline in the availability of water and crops, as well as related decline in income, contributing to decreasing nutrition levels of children.

#### *Insufficient Income and Indebtedness*

Inadequate income from farming is another theme that emerged from the qualitative data, which caused most HHHs and young HH members to migrate to nearby cities or areas in search of employment opportunities. As noted by the respondent of HH KII in Thanamalwila, his family had built the house they live in with just the walls. But now, with the current economic problem, "it is impossible to build beyond that" as they cannot get sufficient income by chena cultivation. As such, they normally seek jobs in the areas like Colombo and Ratnapura, where they involve as construction laborers, such as for mixing concrete. Similarly, a respondent of HH KII from Horowpathana mentioned that "other than cultivation, going out for work is the only option because if I depend on cultivation, I get nothing".

Similarly, indebtedness is one of the most compelling reasons for farmers to migrate either seasonally or temporarily to nearby cities in search of employment options other than agriculture. For instance, as evident from several HH KIIs and officer KIIs conducted in Monaragala and Anuradhapura districts, farmers cultivate their lands by incurring short to medium-term debts or by pawning jewelry or other valued assets in hand. However, with the unexpected yield reductions due to drought, erratic rainfall patterns and fertilizer issues, they are compelled to migrate to nearby cities looking for other sources of income to repay their debts or regain their assets. This is a common scenario during drought periods, as highlighted across several KIIs in the dry zone. For instance, the HHH in HH KII from Thanamalwila mentioned that "everyone in this area goes to jobs due to economic problems. We always owe money to people and banks. They are reasons for that [migration] decision". Similar situations were reflected in qualitative data from Anuradhapura. For instance, a HH KII held in Horowpathana underscored how the crop failures during the drought resulted in indebtedness - "we had to pawn everything, including the paddy field. So, he [husband] had to go finally".

Moreover, as revealed in several other HH KIIs, most HHs had to purchase their daily essentials on a credit basis. For instance, as stated in one of HH KII21 held in Thanamalwila, "normally during droughts, our crop cultivations get damaged and we have to borrow goods from shops or borrow money from friends and give it at the end of the month. So as soon as we get income from other works, we'll pay off the debts". Faced with such financial difficulties, farmers in these areas had to reluctantly consider migration to repay their debts and feed their families.

#### *Disruption of Education and Limited Livelihood/Education Opportunities*

When faced with income issues, disruption of children's education was a common theme among HHs affected by drought. Qualitative data revealed that most children drop out of school after O/Ls due to low HH income, especially during periods of drought. For instance, a HH KII in Thanamalwila underscored that their eldest son's education had been halted following O/Ls. According to him, his son wanted to support the family thereafter by taking up a security job. This point was further validated by officials, where an official during a KII noted that "with the economic difficulties of the families, the children get only basic education. They no longer pursue education and instead go for a job in other areas without burdening their parents". A similar trend was confirmed in Thanamalwila during a KII, where an ASN officer explained how the impact of drought and related economic problems had halted children's education. Elaborating on how the drought-related low incomes affect education, he mentioned that "a culture and a system have been developed where just going to school is not enough" and paid tuition classes are needed for students. As such, when the HH economy collapses due to drought, the children in these HHs get only a basic education provided free of charge. This makes it hard for the students to perform, "resulting in them no longer pursuing education and instead going for jobs in other areas without burdening their parents". Similarly, the lack of educational and/or non-farm/agricultural livelihood opportunities available at the village level also drives migration. This was repeatedly mentioned during several HH and officer KIIs, highlighting the prominence of this phenomenon among youth. For instance, as mentioned by one of the officers KII "there is less focus on opportunities for higher education after O/L and developing certain skills after A/L in these areas. There are also people who go to outside areas for education. They go to their relatives' homes in other areas to study and get a job".

### *Human-Elephant Conflict*

As revealed in many HH and officer KIs, human-elephant conflict also acts as a push factor of migration in drought-prone areas. As revealed by the officer in a KI in Thanamalwila, during drought, “elephants come to the village when they have nothing to eat in the jungle”. In most cases, elephants damage crop cultivations and harvests, which affects HH earnings. On the contrary, as mentioned in one of HH KI in Horowpathana, wild animals destroy their crops regardless of the season. As mentioned, “this time, they [elephants] ate it all whilst we were watching. About 3 acres”. For elephants, there is no season and it does not change as per seasons - “there is nothing like a particular month” and “the issue with wild elephants does not reduce”. The government’s efforts to make a fence in these areas have not been successful. For instance, a fence built in Sooriyawewa was destroyed by the elephants. As such, this human-elephant conflict issue is more prominent in the areas in dry zone such as Anuradhapura, Monaragala and Hambantota.

### *Factors at the Destinations*

As evident from qualitative data and literature, migration is also influenced by several pull factors indirectly related to climate impacts. For instance, economic opportunities, such as better employment options in urban areas, is one pull factor for individuals of all working ages. Such migration helps reduce uncertainty and risks emerging from droughts and related climate impacts. This was repeatedly mentioned in several HH and officer KIs, whereas people tend to migrate to urban areas looking for better livelihoods and employment opportunities. For instance, most village youths have temporarily moved to urban areas to pursue jobs in garment factories, shops, security firms and other work sites.

Another pull factor for migration is networks. As emerged from qualitative data, well-established community networks/social relationships increase the chances of migration and repeat migration when faced with droughts. For instance, as mentioned by one of the temporary migrants in a HH KI “people who work as bricklayers call and inform me to come to the site when there’s work. After that, we 5 or 6 people get together and go for it”. Also, as evident from one KI with an official, “most of the time they [temporary migrants] go through a friend or other connections. Sometimes, job programmes are done in those areas. Then, they go outside areas through this programme”. As highlighted in qualitative data, such pull factors are often seen in areas such as Colombo and Katunayake.

Moreover, the factors like proximity to origin and connectivity (such as transport services facilitated by the employers) act as pull factors of migration for most of the temporary migrants who moved out from the village searching for employment opportunities. As evident from the FGD held in Anuradhapura, “those transport services are of course available but even for those, they go from home because transport services are provided by all the garments and factories.”

## **5.1.2 Impact of Drought-related Migration**

### *Left Behind Individuals*

Given the presence of droughts and related temporary or seasonal migration, family members left behind also face many economic, social and psychosocial issues. Also, these impacts were much more prominent among the most vulnerable groups, including women, children, youth, elderly and differently abled, as evident from the qualitative data of the study. Additionally, female headed HHs are also prevalent in many droughts-affected areas as a result of such temporary or seasonal migration of men due to drought and related issues.

### *Transitioning of Gender Roles*

As discussed in the above sections, when most of the men in the villages - mainly HHHs, tend to migrate temporarily to other areas looking for other employment opportunities, women have to transition to the role of HHHs. In addition to becoming the HHH, often women have to take on both parental and gender roles in continuing farming activities, feeding their children, taking them to school and looking after children and so on. This was evident from most of the KIs held with HH left behind, whereas women have to take all the HH responsibilities while men are away. See Chapter 4 (RQ5) for a related detailed analysis from the point of view of a left behind HH.



### *Economic Impacts*

Even though temporary migration during drought is considered mainly to increase HH income, most of the female headed HHs stated as the earnings sent by the migrants were not sufficient to fulfill the daily food requirement of their family members. The main reason for the difficulty in managing the remittances to cover HH expenditure stems from the high indebtedness that has been a reason that has necessitated migration. For instance, as mentioned in one of HH KIs in Horowpathana “food problem at home is much severe, while the husband is away. Like with having to repay the loans and all it became hard for us to manage from the small sum of money sent by him [husband]”.

### *Food Security Problems*

The food security problem is also emerging as one of the major impacts on HH left behind, as revealed in most of the HH KIs and case studies. As mentioned in one case study held with HH left behind in the Horowpathana area, “it is so hard to live. Rich people won’t understand, the people in the middle are affected more. Even small people eat” as in the village they “grow things like Murunga and Polos(Moringa and baby Jack)” which we don’t have in our gardens nor can we afford to buy then here. One HH KI in Thanamalwila stated, “we have cut down on meals and save as much as we can to repay the loans”. With these concerns, most women aim to balance HH chores and farming activities to feed their families. For instance, as mentioned by one of HH left behind “now I don’t sell paddy after I get the harvest. I’ll even get a loan and repay it if needed. Because if you have rice, at least you will eat. Now even if you have money, you can’t find good rice. So, when I keep the rice, I can somehow feed them”.

In terms of social impacts, qualitative data reveals the impact on children’s education, where in some instances, children’s education was halted due to economic problems. For instance, as evident from one of HH KI “son went to a security job last month. There was no way for him to attend [tuition] classes. So, he stopped attending classes after two months due to a lack of money. It’s not easy to do A/L. The bus fare cost is LKR 400 from here [Monaragala] to Embilipitiya. The class fee is about LKR 5000. So he had to go to both classes and school. After my hand was broken, the child decided to stop classes and go to work. Because there is no money to study.” As such, the inability to spend on children’s education was repeatedly mentioned in several HH KIs, held in drought prevalent areas.

### *Health Impacts*

Another issue that emerged from the qualitative findings of this study was the impact on the health and medical care of the elderly and differently abled people who are left behind. As revealed by one of HH KI in Thanamalwila. “it’s been almost a month now without medicine. We are unable to go. I want to go to Pannamure but didn’t go for a month because I don’t have money for medicine and X-ray.” Similarly, this was evident from another HH KI held in Horowpathana “there were problems, couldn’t get some medicines for my mother, as the economy was so low”. Also, as evident from qualitative data, droughts lead to malnutrition problems for children due to a lack of food availability. As mentioned by one of the officers, KI “drought causes many health problems such as lack of food, decreasing nutritional status of children”.

### *Social Impacts*

In addition, qualitative data highlights safety concerns among left behind women and children when men in the families have migrated. As evident from one of HH KI “even now, I’m afraid when appachchi [father] is not at home. Because my daughter and I are alone. If the son was there, then nothing to fear. Since my son is not there, we keep the door closed at all times.” This was further revealed by an officer during a KI as “if mother is engaged in some work while the father is away for work, the children become insecure”. Beyond these, a KI with an officer in Thanamalwila highlighted some incidents of child abuse and drug addiction with a parent being away from their family due to economic problems. “It means children and family become insecure”.

Additionally, the impacts on social relationships/social ties were highlighted in a few of the KIs held with HHs left behind in those areas. For instance, as highlighted by one respondent, “when we couldn’t go to the events like funerals, weddings, almsgivings of our neighborhood, they won’t come to our home. It’s the weakest thing in society. If we couldn’t go to their funeral, they wouldn’t come to ours.” Moreover, due to the reciprocity expected in society, it becomes hard for a female headed HH or not having both husband and wife makes it hard for the left behind (women in most cases) to fulfill all social expectations/obligations. This tends to isolate the family left behind and creating many psychosocial issues.

However, as revealed in Anuradhapura FGD, elderly and differently abled members in families left behind are often looked after by the relatives or neighborhood in the villages. Similarly, a participant at the FGD held in Anuradhapura

mentioned that “people like that [differently abled] are taken care of by their children. If not, someone in the village will look after them”. Also, in most of the situations, as echoed during the FGD in Anuradhapura, the left behind people like women, children and youth also were looked after by the villagers, for instance, as stated by one of FGD respondents, the left behind “didn’t feel any loneliness, due to the unity and strong relationships maintained by each other in the village.

#### *Psychosocial Impacts*

Moreover, various psychosocial impacts were also apparent in several KIIs with HHs left behind. One such example is the perceived tension due to failure to timely repay the debts when interest is incurred. For instance, as mentioned in one of HH KII “when I couldn’t settle the debts on the relevant dates, I stay at home with much stress that the lenders will come and ask me. Sometimes, I feel like committing suicide”.

### 5.1.3 Coping Strategies

In the face of challenges and problems faced due to drought and related migrations, qualitative data highlights a series of coping strategies adopted by HHs left behind, in specific vulnerable cases. Considering the female headed HHs, women play a major role in fulfilling the responsibilities of each and every family member, amidst the absence of male HHs. For instance, as evident from several KIIs, female HHs are actively engaged in farming, with the help of family members and the community, while men are away. One KII revealed that they rely on “attam”<sup>23</sup> most drought-affected farmers find it hard to pay hired workers at the end of their workday. Therefore, attam is a viable option for them. Another female respondent mentioned that “we get together with sons and do the paddy field. And then go for these crop planting programmes and all”. Also, most women and the family members left behind do gardening or chena cultivation to fulfill their food requirements. One female respondent mentioned, “now I grow vegetables at home to feed my children”. Also, the same respondent mentioned that “I don’t sell paddy after harvest. Because if you have the rice, at least you will eat. So, when I retain the rice stock, I can somehow feed my children although my husband is away”. Further, as evident from qualitative interviews, some HHs have their own food storage systems to be utilized in drought periods. As such, one ASN<sup>24</sup> officer from Thanamalwila mentioned that “there are many HH units that store grains and food items they produce. HHs with good management experience have less food crisis during drought”.

Beyond these, many women engage in self-employment businesses as an additional source of income while men are away. For instance, as mentioned in a KII held with a HH left behind, “I do make bags as self-employment”. Also, in many instances, women get initial startup capital as loans from several village microfinance institutions and societies. As such, one officer mentioned, “there are various self-employment schemes and credit schemes for women. The government also implement various programmes like Samurdhi and women’s societies. Also, some training programmes are implemented by the Divisional Secretariat. Women carry out certain production activities by referring to those programmes”.

Nevertheless, those women are the ones who look after the children, elderly and disabled members of the family while men are away. For instance, as indicated in one of HH KII, “my wife manages all when I am away... since my mother is paralyzed and cannot stand, wife is the one who runs for everything and does most of her work and those of the kids”. Also, in many instances, the elderly “often depends on either pin padi [old age pensions] or Samurdhi subsidies provided by the government”. Moreover, disabled people are also under the care of family members. As per one officer KII, “most of the disabled people are in someone’s care, mainly the family members. People who are not under such care are in children’s home or elder’s home”. However, qualitative data also highlighted support from the neighborhood to continue farming activities as well as caring for the families of migrants.

### 5.1.4 Migrants at Destination

With temporary or seasonal migration, many people face a number of issues in destinations also. As evident from several KIIs, even though these people are being provided with basic necessities such as food, water and accommodation, these have not been provided at a satisfactory level. For instance, as evident from one KII with an officer KII, “as far as I know,

<sup>23</sup> Attam is a reciprocal exchange of labour in paddy farming. It includes an informal contract made between two parties regarding the nature and duration of work to be performed.

<sup>24</sup> ASN: Apadha sahana niladhari

they are generally underprivileged. They don't have access to good quality food. Some stay at those sites, while others have been given a temporary hut/house near those sites.” Furthermore, one respondent in Anuradhapura FGD said, “yes, so I did security work in Colombo. The facilities there are minimal. I did 24-hour duties. The freedom and space there are zero. You don't even get to sleep.” Likewise, in most situations, the migrants are provided minimal facilities at their workplaces, leading them to have a series of problems. Conversely, some migrants stayed in boarding places near their working sites. One respondent in Anuradhapura FGD mentioned, “we stayed in a boarding place close by given to us. It was a house and about 10 of us were living there. So, when you get an off time, you can go take a wash and stay. Didn't have beds and all of course but it was enough.” Also, there are instances where females migrants faced several problems at the destination. For instance, as stated in one of officer KII “there may be situations, which women who go for garment jobs and stay in boarding houses with certain insecure problems”. This shows that the facilities received by temporary migrants in the destination are subject to the type of accommodation the employer provides.

Moreover, qualitative data also brought out several cases of drug addictions, where migrants were introduced to drugs while being away from home. Similarly, when those already using drugs or alcohol migrate, their addictions become more severe while away from the family. Such addictions have resulted from migrants paying lesser attention to families left behind or staying focused on the purpose of migration. For instance, one officer during a KII stated, “if the father is a person who is addicted to drugs when he goes outside areas for work, he rarely looks after his family”. Beyond these, some health-related problems were evident from several KIIs held with migrant workers and their families. For instance, as mentioned by one KII respondent “three days I had a stomachache and had to hospitalize. Everything was looked after by others who worked with me.

Most of the necessities, including food and accommodation, are expensive in destinations. In contrast, the earnings of the migrants are not sufficient enough sometimes, as they need to send a considerable amount to their families as well. For instance, one temporary migrant stated, “when we went out with 6 or 5 people together, we didn't have accommodation. They made a small hut for us and we cooked and stayed there. Sometimes these migrants stay in boarding houses. But most of the time, we stay in small huts. There are places which provide meals. But these are very expensive. So, we cook together”.

#### Case Study of a Temporary Migrant:

##### Mr. Jayatissa's story

This is a farmer from the Nikawewa GN division in the Thanamalwila division, in the Monaragala district in the Uva Province of Sri Lanka. This area falls under the dry zone of Sri Lanka, whereas the main livelihood of many people is agriculture/farming, which continues in two periods of Yala (May to August) and Maha (From September to March).

He is a 60 years old father of two children: eldest, a son and a younger daughter. Both of his children are still receiving an education. His son is now at the university and his daughter is doing her A/Ls.

He owns a total of five acres of land, of which 3 acres are cultivated with vegetables and other field crops such as cowpea, beans, brinjals, millets and mung bean and another 2 acres of coconut cultivation. Additionally, he engages in paddy farming in fields he rents from others.

Normally from August to September every year, his home area is exposed to droughts, which leads to reduced crop yields. During this time, many people tend to move out from his village looking for other employment opportunities in places like construction sites and security firms and so on, to Colombo and Gampaha and to nearby cities in Monaragala and Hambantota districts. However, in 2017, this area was exposed to a prolonged drought leading to many failures in the crop cultivation, a severe decline in yields and the HH income of many families in the village. He and his family also had severe problems during that period, as they could not receive the expected yields from their cultivations. As a result, his family faced several difficulties in spending money for their children's education. As mentioned during the interview, they had had no income, even from coconuts or other cultivations, during drought periods.

But they had to incur many expenses for their son and daughter. “More than the food, we need money for children's education. So, migrating for labor is the only option.” As such, he and his wife considered their

children's education the first priority among all family obligations. Due to insufficient income received during the drought, he decided to migrate to Colombo to work in a construction site. Initially, he found a workplace with a small salary and later, with the contacts made in the field, he could find another place/employment with a considerably higher salary. He mentioned during the interview, "I went for some work close by. It was a very small pay. There, someone told me about that place [a construction site where he started masonry work] and I went there". Based on these networks he established with the supervisor of that site during his employment in the construction site in Colombo now, every year, when there's a drought and insufficient income, he goes to Colombo and works as a temporary migrant worker for one to two months and returns home with some earnings. During such employment as a temporary migrant worker, depending on the hours worked, he could earn between LKR 35,000-70,000 per month. These payments include extra payments for overtime hours performed after 4.30pm.

As a migrant in Colombo, he found accommodation in a place close to the construction site, whereas 7 to 8 of his migrant workmates got together and prepared meals for themselves. When any migrant workers fell ill, their supervisor took them to the base hospital in Mulleriyawa to get treatment. Moreover, the supervisor allowed him to go home anytime when there was an emergency at home. He highlighted that the supervisor "doesn't even mark [me] as absent. Assume I came last night, then I can go back today".

While he was away from home, all the HH activities and responsibilities were taken over by his wife. His wife and the two children looked after the cultivations when he was away. At such times, the relatives and neighbors helped them with farming activities. His wife highlighted how they got support from all around them during her husband's absence. Specially, his "brothers came and helped to plough if needed, when he returned from the construction site in Colombo to attend to the rest of work." This community level support received by female headed HHs is highly beneficial for such families in performing their agriculture activities. The men have migrated out of the village.

However, he recently went to work in 2020 and returned home due to the COVID-19 pandemic. Due to travel restrictions and lockdowns, he and his work colleagues also had to face many difficulties in arranging their logistics; to return to the village and return to Colombo during that period. Thereafter he hasn't migrated for work yet and has no intention to go in the future. The main reason for him to remain in his village instead of migrating is due to the need to balance his other obligations against the income earning capacity of temporary migration. He wanted to look after his coconut cultivation. As he said, "It is good there [construction site in Colombo]. The earnings were much satisfactory and we just have to work only. But the thing is, we have to look after here also." His cultivation has about 80 coconut trees now and about 40 of them are now in average size. As highlighted by him, this is the time he needs to be around to protect this cultivation. Although there's a fence, it does not provide full protection. His village has experienced several damages from elephants. As such, he decided that he can't go far now. As a result, he is only willing to take up employment close by. If he does not find such close by employment options, he has decided to look after his cultivation and stay with my family". Therefore, this implies that having agricultural assets/own assets could impact decision making and decrease the need to migrate migration.

This case study reveals that cultivation is now providing him with some income and he can choose whether to migrate or not, while previously, he was somewhat compelled/forced to migrate to meet ends. Similarly, this case study is evident of how migration was a family level decision jointly taken by him and his wife, while his wife was able and willing to take up the responsibilities at home. Similarly, the existence of community level support mechanism also played a role in his family's experience as a left behind HH, while the networks at the destination helped the migrant to cope away from the family. Similarly, the maintenance of these networks seems to have contributed to his recent somewhat risky decision to stay back. He is aware that he can harness his networks in destination areas and seek a new employment opportunity as a migrant, should his coconut cultivation not give him the expected income.

## 5.2 SEA LEVEL RISE AND MIGRATION

When faced with sea level rise/coastal erosion/salinity, migration occurs due to several reasons, including impacts on existing livelihood strategies, declining HH incomes and destruction of day-to-day HH activities. Thus, temporary or seasonal migration could be identified as a coping strategy adopted by most of the agricultural/fisheries HHs in response to sea level rise and related issues, as discussed in this section. This section also sheds light on a series of impacts of sea level rise and related migration on HHs left behind (including specific vulnerable groups) and migrants, as well as coping strategies adopted by the family members left behind and migrants at the destination.

### 5.2.1 Push and Pull Factors of Migration

#### *Life and livelihoods*

As evident from several HH KIs in Ampara, the fisheries communities are much affected by sea level rise. In the case of fishermen in Ampara, as highlighted during KIs, sea erosion has exposed rocks at the bottom of the ocean's shallow area, damaging the bottom of the boats when reaching land/leaving land. For instance, one HH KI in Ampara highlighted how the fans in the boats were damaged when the boats were pushed to sea due to the rocks. Similarly, such exposed rocks damage their fishing nets. Both nets and boats are highly valued equipment used by fishermen.

As highlighted in many HH KIs conducted in Ampara, severe weather-related events due to changed weather patterns, such as lightning and strong winds, affect the livelihoods of coastal communities. As noted during a KI in Ampara, one fisherman was struck by lightning while in a fishing boat in the sea; he was rendered unconscious for about 2 hours. Subsequently, he had to undergo treatment for 8 months, while the boat he was travelling in was damaged, costing over LKR 800,000 to repair. The qualitative data highlighted that the changing weather patterns had affected lightning intensity, predictability and frequency. These issues, rough seas, rising sea levels and seasonality in fishing cause most fishermen to halt their fisheries activities for a specific period of time in the year. This compelled them to migrate to nearby cities/areas looking for alternative employment options such as working in construction sites, shops, security firms or farmlands to feed their families.

#### *Change in Landscape*

Sea erosion results in changing the landscape in coastal areas. This was evident in the qualitative data collected in Ampara. For instance, as highlighted by a HH KI respondent, the areas where there used to be trees have now become the ocean. He recalled how the area where he used to play Elle (a local game) with his friends and where a navy camp used to be are now being inundated by the sea. Similarly, in Karaitivu, Ampara, the issue of sea erosion has resulted in inundating the docks previously used to anchor boats. This has resulted in boats not having a permanent structure to dock. As per this KI respondent, these changes in the Karaitivu beach landscape have resulted from the Olivil Port development.



Photo 5- 1 : Dock in Karaitivu destroyed due to sea level rise.  
Source: Authors



#### *Challenges in continuing agriculture*

Paddy and other crop cultivations are also highly affected by salinity and sea level rise, as evident from KIIs held in Thalalla, Matara. During the monsoon season, the bed of the estuary opening rises resulting in water from the stream not flowing down towards the sea. In normal times, the estuary opening naturally breaks open after the rain. But when it does not happen naturally, farmers have to artificially dig it open to salvage their paddy fields inundated with seawater. Thus, when the sea water seeps into villages, most of the cultivations are affected and their harvest is damaged. As evident from one of HH KII held in Thalalla, “if sea water remains in the rice plant for more than three days, the plant will die”. The same KII respondent mentioned how their rice becomes bitter due to the higher degree of salinity in soil and groundwater: “Even we pulled it out that way for the Diya Kannaya. But 90 per cent of rice was bitter after it fell in to the water.” As such, qualitative data reveal that in specific areas such as Thalalla paddy cultivation related agricultural livelihoods of people are much affected due to sea level rise. For instance, as mentioned in one of HH KII, our “livelihood is affected since we are mainly engaged in paddy farming, which cannot be done during those periods”. When encountering such circumstances, most HHs migrate to nearby cities looking for additional income sources to feed their families.



Photo 5- 2 : Estuary in Thalalla  
Source: Authors

#### *Cleaning the stream*

To avoid seawater flooding, the communities in Thalalla involve in cleaning streams. However, the recent buildup of a hotel along the stream in Thalalla has altered the natural flow of water. Additionally, these hotels have built bridges along several places. Together these constructions have contributed to flooding and obstructs the cleaning of the streams with an excavator to avoid seawater-related flooding affecting HHs and cultivations.

#### *Indebtedness*

The fishing communities affected by sea level rise-related issues have highlighted the difficulty for continuing their livelihood has aggravated their indebtedness. Usually, paddy cultivation involves borrowing when purchasing seeds and fertilizer for cultivation to be repaid at the time of harvest, as discussed under the agriculture sector in the dry zone above. Thus, crop damage due to sea level rise-related flooding affects these farmers' capacity to repay their loans. Highlighting this, a HH KII respondent in Thalalla indicated that “we have loans. Of course. it is a problem if we do not go to work for at least one day”. Similarly, fishermen incur debt in fisher communities when purchasing or repairing their boats and nets. As highlighted in qualitative data, in addition to personal loans, these loans are sometimes obtained from various financial institutions.

#### *Factors at the Destinations*

As evident from qualitative data and literature, migration is also influenced by several pull factors indirectly related to climate impacts. For instance, economic opportunities, such as better employment options in urban areas, is one pull factor for individuals of all working ages. Such migration helps reduce uncertainty and risks emerging from droughts and related climate impacts. This was repeatedly mentioned in during several KIIs with HHs and officers, whereas people tend to migrate to urban areas looking for better livelihoods and employment opportunities. For instance,

most youth in the villages have temporarily moved to urban areas to pursue jobs in garment factories, shops, security firms and other work sites.

Another pull factor for migration is networks. As emerged from qualitative data, well-established community networks/social relationships increase the chances of migration and repeat migration when faced with droughts. For instance, as mentioned by one of the temporary migrants in a HH KII “people who work as bricklayers call and inform me to come to the site when there’s work. After that, we, 5 or 6 people get together and go for it”. Also, as evident from a KII with an officer “most of the time they [temporary migrants] go through a friend or other connections. Sometimes, job programmes are done in those areas. Then, they go outside areas through this programme”. As highlighted in qualitative data, such pull factors are often seen in areas such as Colombo and Katunayake.

Moreover, the factors like proximity to origin and connectivity (such as transport services facilitated by the employers) act as pull factors of migration for most of the temporary migrants who moved out from the village in search of employment opportunities. As evident from the FGD held in Anuradhapura, “those transport services are of course available but even for those they go from home because all the garments and factories provide transport services”.

### 5.2.2 IMPACT OF SEA LEVEL RISE-RELATED MIGRATION

With the occurrence of sea level rise/coastal erosion/salinity and related temporary or seasonal migration, family members left behind also face several economic, social and psychosocial issues. Among the left behind, the vulnerable groups, including women, children, elderly, youth and differently able individuals, are more prone to severe negative impacts as their HHs are impacted by seasonal migration.

#### *Transitioning Gender Roles*

When considering agriculture HHs, most of the women are engaged in farming activities, while the men are out of the village. As stated in one of HH KII “mostly women are the ones who engage in the agricultural activities, while our husbands are out of the village. However, my husband comes and supports me when there is a difficult work in the field, but the rest is done by me and my children with the help of others in the village.” As such, women play an active role in agriculture labor force, given the climate induced migration and related economic hardships with the slow onset events like sea level rise.

Also due to labor shortage created as a result of seasonal labor migration, often female labor substitutes for male labour in many of the agriculture activities in the left behind area. For instance, as mentioned in one of KII held with HH left behind “now really more work is done by females than by males. Therefore, now it is all females. Now the past few times when we were cutting the harvest, it was about 3 or 4 in the night when I came home. That is when start one “paavara” in the morning, it finishes by 5pm. So that is how we manage”. Additionally, the left individuals from different HHs join together in “attam” to help each other free of charge for agriculture work.

#### *Economic Impacts*

On the one hand, the direct impact of sea level rise-related flooding is the destruction of their assets and belongings. As identified in field work in Thalalla, about 15 to 20 houses go completely under water when flooded. The residents of such houses move to higher ground. As such, as highlighted in a KII in Thalalla, in addition to affecting paddy fields the-sea level rise-related flooding affects the harvested paddy stored in HHs as well. Similarly, in Ampara, when a fisherman was injured due to a lightning strike while fishing and lost income for a long period of time, no formal mechanism was in place to help such situations. As such, the daughter of this fisherman had to stay at home for two years after doing O/L as the parents could not afford to spend LKR 250 per month for a private tuition class. In response to several challenges and problems experienced due to sea level rise and related migrations, qualitative data of this study also highlight a series of coping strategies adopted by HH left behind, including vulnerable groups of women, children, youth and elderly and so on.

#### *Health Impacts*

Households that face seawater flooding face various health issues. These issues include drinking water-related issues, stomachache and rotting of legs for the water. At the same time, they face sewerage-related issues when the stream is dug to expand the estuary and the water goes around the septic tanks where the flood water contaminates with septic tank water.



### *Psychosocial Impacts*

The related implications of these events were much more prominent among the most vulnerable groups, including women, children, youth, elderly and differently abled, as evident from the qualitative findings of the study. For instance, most of the time, when mothers are also away from home for farming and other field work, children or youth remain at home alone with a sense of fear. As revealed in one of HH KII held in Thalalla, “the three of them [children] close the doors and wait at home until I return home. So that is how we manage”. At the same time, during the days that seawater comes into the land, specific places on the road get flooded. In such circumstances, children cannot go to school.

In the case of sea level rise, the changing coastline brings back fearful memories related to the 2004 Tsunami among most inhabitants in coastal regions in Ampara. For instance, during a HH KII, it was revealed that “from time to time, the sea comes into the village” and the extent of coastal flooding this year has been much more than last year. Noticing this difference, “children ask [their parents] why the situation is different from previous time”. Some “children do not want to be here now due to fear. There are scared of losing their parents”.

### 5.2.3 COPING MECHANISMS

Additionally, community level coping mechanisms are adopted to address seawater intrusion-related flooding. For instance, to protect their cultivation before crops are fully destroyed, villagers either pool their labour to dig the estuary opening or pool funds and hire a backhoe to do the same. As noted in KIIs, the Irrigation Department also supports this community by sending a backhoe to dig the estuary. At such times, the community pools and pays for diesel for the backhoe. However, as noted by a KII respondent from Thalalla, “but we don’t always trouble them since the dozer [backhoe] is only required when you have to cut a lot”.

To balance the seawater intrusion, the community had previously invested in sluice gates for approximately LKR 200,000. When the fields are filled with water, the sluice gate has to be opened and when the seawater starts coming in, it has to be closed. However, the effectiveness of using sluice gates has been limited in Thalalla, as opening the gate is hard due to the sheer size of the gates. Due to this practical difficulty of opening and closing, sometimes the gates are always closed where the sea water does not come in. But in such cases, the water in the fields also does not go out. Additionally, there have been lapses in the maintenance of the gates, limiting its effectiveness.



Photo 5- 3 : Sluice gate at the estuary in Thalalla  
Source: Authors

Moreover, in response to the bitter taste of rice due to salinity, many tend to use a specific rice variety that resists soil salinity. Similarly, farmers have cut the harvest on benches to protect the crop from seawater intrusion related to flooding. Specifically, as mentioned by a HH KII respondent in Thalalla, “we brought from the temple, the benches that students sit on and we kept it in the field. ... So, we cut and keep it on the bench. Then we take it from the bench, keep it on our head and go”.

Moreover, the family members left behind grow vegetables in their gardens for their own consumption and even the rest is sold. For instance, as stated by one KII respondent, “for an alternative, I continue growing and we never buy vegetables from the shop now, we have grown all. We have been given Thumba plants so we can harvest it at least once a week. Every other day I put about 6 to 7 kilos of beans to the shops”.

Also, when considering the HHs of migratory fishermen, most of the families left behind rely on the initial advance payment received by the fishermen from the time before fishermen seasonally migrate and return. Specially this advance amount they receive is used to cover their daily expenses while the fishermen are out of the village. For instance, one of the migratory fishermen from Puttalam mentioned, “I am also here because there are not many labor jobs there. So, when we need some money, we take about LKR 50,000 from Raala,<sup>25</sup> give to our families and then we come here. We do work for about 6 months here and then go back to our villages”.

While men are away, women are the ones who carry out every other obligation of the families. This is a common scenario when both farmers and migratory fishermen are away from their families. As was evident in qualitative data, women and families left behind tend to continue agricultural activities by engaging in agricultural activities while the men are outside of the village. Thus, family labor plays a significant role in substituting/filling the labor gap created in the origin areas with such seasonal labor migration. This situation is also common in agricultural areas like Thalalla in the Matara district, where the sea level rise is highly prominent. For instance, as stated by one of HH left behind, “The oldest daughter has to be sent to work. So, I take her on the bike in the morning. The two younger daughters are also dropped off at school, so all three are done simultaneously. Then I come home and go to work. Then I bring them back home and then take them for any classes they have and bring them back. So that is my job. Husband only earns.” As such, the gender roles have been transitioned and most women in left behind families had to play both roles of HHH and parent. For instance, as stated by one female headed HH in Thalalla, “Husband only earns”, which clearly shows how she has taken the responsibilities of the whole family while her husband is away.

Also, of those left behind families, while the mothers are away at home for farming and other work, children or youth remain at their places, with a sense of fear. But most of the time, they could sacrifice and manage. As revealed in one of HH KII held in Thalalla, “The 3 of them [children] always keep the doors closed and wait at home. Then, after work, I return home. So that is how we manage.”

## 5.2.4 MIGRANTS AT THE DESTINATION

Considering the temporary or seasonal migratory fishermen, many also face several issues at their destinations. One such impact is the perceived threat/risk to their lives, while they are in the sea for fishing. For instance, as one of the migratory fishermen in Trincomalee mentioned, “we are always in the sea. If we go in the evening, we only return the next morning. If a storm comes, we will be at sea. So that is why we have less security since we never know what time a storm would hit.” Also, another migratory fisherman stated that “if there is a storm or something, we won’t go for fishing. I mean, why should we just die?” As such, their lives as well as livelihoods, are also at risk due to various climate impacts at the destinations.

Moreover, sometimes due to sea level rise and strong storms, seawater comes into their huts. As stated by one of the migratory fishermen, “here, if there is a big storm, then everything starts to break. Once, the seawater also came into the Vadiya,<sup>26</sup> that we stay in.” Likewise, they have to undergo various problems at the destination due to the incidents of rough sea, storms and sea level rise.

For seasonal migratory fishermen, most of the basic necessities, including food, water, accommodation and sanitation, are provided by the owners of the fishing businesses, which was revealed consistently across KIIs. For instance, as a KII respondent mentioned, “owners give us food, supervisor puts our salary, so we know. Even if they are running a loss, our salaries will be paid by the owners.” Another migrant fisherman said “we stay in the “vadiya”. There, we can cook and eat also.” Also, during some periods when there were high storms and they could not go fishing, some fishermen were still cared for by their employers. For instance, one of the migratory fishermen in Trincomalee stated, “when there’s no adequate fish and nothing to unload, so it affects them [owners] also. So, they have to feed 30 of us here and then the costs for the diesel and petrol. It requires more than 25kg of rice to cook. So, we also try to catch more fish. If we sell that, then only we get more money. Otherwise, how would the owners manage the costs? We also have

<sup>25</sup> Raala is the one who owns fishing gears and boats and running the fishing business

<sup>26</sup> Vadiya is the place [hut close to sea] where the migratory fishermen stay and rest

to be dedicated along with them.” This shows the commitment of seasonal migrants to ensure that the employers earn income to cover the costs the employers incur on behalf of the seasonal migrant. Qualitative data also highlighted instances where employers deducted salaries to compensate for food and other expenses. As revealed in one of KII, “but I don’t know why they didn’t pay 15 days salary. The employers arrange the house, water sanitation, electricity and other all facilities for us. if I work for 45 days, I will get LKR 45000. But they reduce LKR 1000 for meals and house rent and pay me only LKR 35000”. Such contradictory evidence indicates that the outcomes for seasonal migrants also depend on the employer and his approach to treating seasonal migrants. The wage deductions indicated a case of limited transparency of calculation and payment of wages between employer and employee.

Moreover, insufficient income/salaries received at the destination due to the current economic crisis and bad habits like drug addictions were also evident from several KIIs. As evident in one case study held with migratory fishermen in the Kuchchaweli division, “I came here to achieve my goals. I don’t use any drugs or alcohol. So, I save my money and use it efficiently. So, I settled my loans, bought a new piece of land and built fence. But my other colleagues have some bad habits. So, this salary is not enough for them”.

Further, one case study held with migratory fishermen in Kuchchaweli Division revealed that the salaries received by most migratory fishermen are sent to their families in the origin area through a middleman who connects them with the employer. As mentioned by the relevant KII respondent “in my village, there is a lady who arranges workers for this fishery jobs for our boss. She is the one who is responsible for me. Our salary will be send to her bank account and she will transfer the money to my family”. This is how most migratory fishermen in the Kuchchaweli area transferred their earnings to their families.



Photo 5- 4 : Facilities in a seasonal migratory fishing hut in Kuchchaweli.

Source: Authors

In the case of migrants from agricultural communities, migrants from a single area of origin go to a destination area together and share a living space. The husband of a KII respondent in Thalalla was involved in taking contracts for construction and they made a tent on the worksite and lived there. The wife sent all spices and rice for cooking to ensure the husband did not have to go out during the pandemic.

As discussed in the above sections, events like drought and sea level rise cause people to migrate seasonally, within a specific period of the year. For instance, most farmers in dry zone are compelled to migrate during the Yala season, given the severity of drought and insufficient water for their cultivation. For instance, one such migrant from Thanamalwila stated, “we go in April and return in June or July for clearing lands and chena”. In the case of seasonal fishermen migrating from areas like Puttalam, Chilaw, Valachchenai and Batticaloa to Trincomalee often arrives in February and return in October.

### 5.3 SUMMARY

Focusing on drought and sea level rise, this chapter provided a qualitative analysis of how they relate to seasonal and temporary migration through the resilience building, preparedness, response and recovery phases associated with climate disasters. When faced with declining crop yields, neglect of tanks or cascade systems and a lack of water availability associated with climate disaster, people resort to migration from affected areas to mitigate the implications of climate disaster. Many farmers move out as temporary or seasonal migrant workers during the Yala season, when farming is not done due to water scarcity. The vast dry zone areas frequently experience this situation. Communities in such areas also face health problems linked to the lack of water. Other push factors include insufficient income, debt and the human-elephant conflict. Improved employment opportunities in cities, well-established social networks and proximity to destinations act as pull factors towards migrating away from drought-prone regions.

Family members of such migrants also suffer a variety of problems from economic, social and psychosocial stances. Women are compelled to shift to the role of HHHs, take on parental and gender duties, continue farming operations and balance HH income, expenses and debt, among other things. In the case of children, issues on safety, addictions, disruption in education and poor nutrition and health are some related implications. At the HH level, families utilize social safety nets in addition to self-employment and other alternative means of income generation to face some of these challenges. Similarly, migrants also deal with various hardships while living away from their families.

Sea water flooding caused by sea level rise impacts HHs and livelihoods in fishing and farming, damages crops and impairs farmers' and fishermen's ability to pay back loans and buy or fix equipment essential to their respective livelihoods. This affects their capacity for resilience and preparedness for climate disasters. In the case of fishermen, sea level erosion and the resulting exposure of rocks at the ocean's bottom cause damage to the bottom of the boats, which has significant economic repercussions. When faced with these climate issues, some resort to migration, which affects their response and recovery strategies. These strategies are shaped by the wide range of economic, social and emotional issues faced by the families and family members left behind due to migration related to these climate disasters. Due to sea level rise, their homes, belongings and paddy fields are destroyed. Flooding resulting from sea level rise also harms harvested paddy preserved in homes, taints drinking water and is harmful to health. Most migratory fishermen's HHs rely on the lump sum advance for recruitment for HH expenses in the absence of the migrant. At their destinations, these seasonal migratory fishermen benefit from having or being provided with most of the basic essentials, such as food, water, housing and sanitation provided by their employers/owners of the fishing huts. Yet, these fishermen are also exposed to dangers such as storms and and so on, while at sea. Other issues at the destination include the insufficiency of wages earned due to the current economic crisis and wasteful and addictive behaviors.

## 6. SYNTHESIS OF FINDINGS AND RECOMMENDATIONS

### 6.1 SYNTHESIS OF FINDINGS

The detailed and comprehensive analysis of the nexus between climate change and mobility in Sri Lanka leads to many synthesized findings, outlined below:

1. All types of climate disasters have a negative impact on HH income and livelihood activities. As such, HHs adopt various coping strategies when faced with climate disasters.
  - a. Although affected communities have, in practice adopted several effective coping strategies during the preparedness, mitigation, response and recovery phases of climate disaster, many are nevertheless unable to identify these solutions as coping strategies
  - b. Most popular coping strategies involve micro level solutions within the HH.
  - c. Displacement and permanent migration are identified by those affected, as a coping strategy for sudden onset climate disasters.
  - d. Despite migration and related remittances contributing towards HH income and livelihood options, the importance of migration and remittances in the context of coping strategies for climate events is not fully comprehended by those facing climate disaster.
  - e. These gaps are likely due to coping strategies becoming a routine part to peoples' lives, limiting their capacity to identify them specifically.
2. There is evidence that rapid onset events are more closely associated with displacement and/or permanent migration, while sea level rise and drought events are associated more with temporary or seasonal migration.
3. People impacted by sea level rise and drought have a greater level of selectivity in their mobility decisions compared to those impacted by rapid onset events.
  - a. Displacement and permanent relocations do not allow a selection process but necessitates all HH members to move.
    - i. Displacement and permanent migration involve the mobility of vulnerable groups - children, youth, women and differently abled persons, along with the rest of the HH.
  - b. There is selectivity in migration in the case of temporary and seasonal migration.
    - i. This selectivity in temporary and seasonal migration mainly favours men, those of working ages and those having education up to secondary level.
  - c. HHs select the most suitable HH member for seasonal and temporary migration.
4. In identifying climate disasters as reasons for mobility, there is a clear distinction between sea level rise and drought and rapid onset events.
  - a. Rapid onset events have a high correlation with being identified as a reason for mobility.
  - b. Sea level rise and drought onset events have a very low correlation with being identified as a reason for mobility.
  - c. The relatively shorter lag between the threat of the climate disaster and response in terms of displacement and sudden and often-dramatic removal from their place of residence to a shelter enables victims to easily identify and recall climate-induced mobility. In contrast, the indirect connection during the response and recovery phase through livelihoods and opportunities and the time lag between sea level rise and drought and migration makes climate-induced migration hard to be identified in the instances of sea level rise and drought.
5. Mobility is associated with greater livelihood options.
  - a. Livelihood factors play an important role in the push and pull factors for migration when faced with climate disasters.
  - b. Internal migration for climate reasons is linked to the higher income earning capacity at destinations.



6. State and other stakeholders provide different forms of post-disaster support. Yet
  - a. As perceived by those affected, there is an overall disparity in the support provided for rapid onset versus sea level rise and drought, to the disadvantage of the latter.
  - b. Within support measures, there is a clear absence of psychological support for those affected.
  - c. During the early stages of sea level rise and drought, sufficient support is not provided to those affected.
7. When faced with climate disaster, displacement, relocation, or permanent migration are **difficult decisions** to make and often made as a last resort, or when compelled by state authorities or circumstances. On the contrary, temporary and seasonal migration is a more calculated decision leading to a more willing HH member to move.
8. Displacement and temporary and seasonal migration related to climate disasters involve **returning to the origin** and continuing ties with the origin. In contrast, permanent relocation/migration due to climate disasters involves minimal intention or capacity to return with decreasing capacity to maintain ties with the origin.
  - a. The complete removal from the place of origin in most cases of permanent relocation causes livelihood challenges.

## 6.2 AREAS FOR FUTURE RESEARCH

The analysis also points towards research areas that were not covered under the scope of this study yet would be useful in better understanding the nexus between climate change and human mobility. One such future research area is to isolate the causal effect of exposure to climate hazards on mobility. When faced with climate hazards, as shown by Foresite's framework, this exposure interacts with various micro, macro and meso level factors. As such, exposure to climate hazards is only one of many macro level factors that induce human mobility. Observing two variables (climate hazards and human mobility) moving together (either in a positive or negative relationship) does not necessarily imply one variable causes the other. Understanding that correlation does not mean causation, the current study focuses on the nexus, correlation or association between climate change and human mobility. Yet, sharing and validating the findings of this study with stakeholders indicated their curiosity in knowing the causal effect of climate change on human mobility in Sri Lanka.

Other areas for future research include expansion to the scope of research covered in this study. Specifically, future research could focus on types of climate hazards not focused on the current study – such as loss of biodiversity, land and forest degradation and cyclones, focusing on the nexus between climate change and international migration. At the same time, future research may also disaggregate drought by its various technicalities, such as urban, rural, socio-economic, agricultural and ecological drought, to name a few and focus on one or more of these. Similarly, the vulnerable groups focused could be expanded to include other vulnerable groups such as mentally or socially disadvantaged persons and indigenous persons, while greater and in-depth analysis can be undertaken on either social or economic aspects instead of covering both in the same analysis as done here. Furthermore, the research scope can be widened to consider a longer timeline and a wider geographical representation. Similarly, future research is needed on the psychosocial aspects of the nexus between climate and human mobility in Sri Lanka, to provide empirical evidence to establish the dearth and the need for support for the psychological wellbeing of persons exposed to climate change and human mobility.



## 6.3 RECOMMENDATIONS

The recommendations presented in the report are formulated as informed by the analysis and findings. They are context specific to the limits of the study. Further, the recommendations are formulated to influence the overall policy-level decision processes through identified implementable actions and programmes. Thus, the list of recommendations takes a bottom-up approach.

1. Develop a roadmap/ guideline to advocate integrating human mobility dimensions and their associated socio-economic impacts into climate change-related and other development policies, programmes, and frameworks.

### Recommended Implementable Actions

- a. Strengthen the inter-ministerial coordination mechanism to mainstream policy revision and formulation process.
  - b. Advocate for inter-agency dialogue to identify the impact of climate change as a cross-cutting issue affecting gender, youth, disability, gender-based violence and human mobility in development policies and programmes.
  - c. Identify and include a cost-benefit-analysis of the impact of human mobility into Nationally-determined-Contributions (NDCs)
  - d. Assess and incorporate the loss and damage associated with climate-induced human mobility into the forthcoming NDC revision on loss and damage.
2. Build resilience and coping strategies for the affected communities through improved disaster risk reduction and preparedness programming targeting the communities in climate-vulnerable areas.

### Recommended Implementable Actions

- a. Strengthen and promote community-based capacity-building programmes - material help, knowledge, and monitoring in fortifying residents to withstand natural hazards, for instance, capacity-building programmes, and community-based disaster risk reduction planning.
  - b. Strengthen income diversification to increase resilience towards the impacts of climate change.
  - c. Introduce vulnerable group-specific programmes to increase resilience through improved coping strategies.
  - d. Strengthen early warning systems and information dissemination mechanisms - update and introduce simplified early warning systems at community level social media platforms such as WhatsApp.
3. Introduce programmes through policy provisions for communities at risk of being pushed to migrate because of climate-induced reasons to make informed decisions about their mobility decisions.

### Recommended Implementable Actions

- a. Introduce programmes to increase the financial literacy of people migrating for better livelihoods from their places of origin.
  - b. Introduce and improve access to formal skill development programmes for people to acquire vocational training in areas of demand.
  - c. Increase opportunities for voluntary migration decision process improved access to information.
4. Enhance the social welfare and social protection coordination mechanisms through improved policy provisions.

### Recommended Implementable Actions

- a. Improve access to services and social welfare systems for families left behind in migration.
- b. Enhance capacities of the social welfare office at the divisional level through proper and regular training programmes.
- c. Provide and improve counselling services and access to such services for at-risk and affected communities.
- d. Include awareness of gender-based violence in camp coordination and camp-management guidelines.
- e. Establish guidelines for social welfare standards for displacement camps. i.e., the proportion of WASH facilities per gender category. And gender-sensitive displacement camp designs.
- f. Improve accessibility for free counselling sessions at community levels for women, children, and other vulnerable left-behind groups.

5. Develop a bottom-up approach towards more systematic community, regional and national level coping mechanisms.

#### Recommended Implementable Actions

- a. Strengthen and scale up the community-based response and coping mechanisms.
  - b. Strengthen community-based disaster risk reduction programmes.
  - c. Promote and strengthen CSO engagement in community-driven programmes.
  - d. Promote engagement of rural development societies in programme planning and implementation.
  - e. Improve resettlement plans.
6. Leverage innovative financial mechanisms for resilience and building back better.

#### Recommended Implementable Actions

- a. Introduce and promote public-private partnerships for index-based insurance schemes targeting the livelihoods impacted by climate effects.
- b. Increase the financial literacy of smallholder farmers and workers in the informal sector.
- c. Improve access to banking facilities targeting the informal sector employees.
- d. Provide training and awareness on value addition, income diversification and fallback mechanisms through public-private interventions.

The recommended policy-level actions require a high level of engagement from the National Physical Planning Department to state and provincial level line ministries. The specific implementable actions require all responsible development sectors and subject expertise ministries, departments, development partners, and academia to coordinate and communicate in planning, designing, implementing, monitoring, and reporting the actions on climate-induced migration.

Furthermore, the findings and recommendations can feed into promoting sustainable mobility through strengthened community resilience towards climate change. Similarly, this study's findings can also influence mobility inclusion in development plans, climate change and disaster policy frameworks and inform long term targeted investments in rural development. Towards this, it is recommended to mainstream migration into development, where all development plans, climate change and disaster policy frameworks, other plans need to take the impact from migration into account, as well as factor in the impact on migration. Moreover, long term targeted investments in rural development plans needs to factor in accessibility issues triggered by climate disasters and strive to introduce climate resilient infrastructure.

Finally, mobility takes place at a personal and an individual level, in most contexts of climate disasters except for some instances of relocation. When such migration or mobility takes place using individual resources and networks, excessive intervention by stakeholders must not complicate the accessibility to migration as a coping strategy, often used as a last resort.

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