

**Wellbeing and justice dimensions of planned relocation  
under climate change for socially marginalised communities**

Submitted by Oana Stefancu to the University of Exeter

As a thesis for the degree of

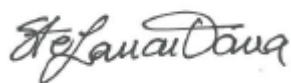
Doctor of Philosophy in Geography (Human)

May 2022

This thesis is available for Library use on the understanding that it is copyright material and that no quotation from the thesis may be published without proper acknowledgement.

I certify that all material in this thesis which is not my own work has been identified and that no material has previously been submitted and approved for the award of a degree by this or any other University.

Signature:



## **Acknowledgements**

I could not have undertaken this journey without the guidance and encouragement of my supervisors, Prof. William Neil Adger, Dr. Louisa Evans, and Dr. Ricardo Safra de Campos. Words cannot express my gratitude for the continued professional and personal support they offered me over the past four years. I would also like to thank Prof. Tuhin Ghosh and Prof. Sugata Hazra, who generously provided knowledge and expertise. Special thanks should go to Sumana Banerjee, who was instrumental in the organisation of my trips to India, and to Shouvik Das, Sukanya Banerjee, Roorpleena Porel, and Ansar Sekh for their invaluable help with the fieldwork in the Ganges-Brahmaputra Delta. Additionally, this endeavour would not have been possible without the generous support of the University of Exeter Vice-Chancellor's Scholarship and DECCMA.

I am also grateful to Dr. Rachel Manning, Dr. Matthew Holden, Dr. Roger Auster, and Dr. Nicola Ellis for sharing this PhD journey with me and becoming great friends; to George D. S. Collett for always being my support system; Elena Stefancu, Bianca Stefancu, and Roberto Generali for making me believe that I can achieve whatever I put my mind to; and to Dylan, for always putting a smile on my face. I would like to dedicate this work to the memory of Ioan Stefancu, Sylvia Collett, and Geoffrey Smedley, who were the biggest supporters of this endeavour before it even started.

Lastly, I would be remiss in not mentioning all the people from Ghoramara Island and Sagar Island that participated in this study and welcomed me into their communities.

## **Abstract**

This thesis examines the impact of government action and inaction in the context of climate change adaptation on people's wellbeing and perceptions of fairness. Whilst it acknowledges the spectrum of government action and inaction for comparative purposes, the central focus of this thesis is on planned relocation. The thesis addresses three well-identified knowledge gaps.

First, evaluations of planned relocation commonly focus on the risks and benefits of government intervention, often overlooking the consequences of not intervening. This study, therefore, accounts for uneven government action and inaction, looking across the range of outcomes by developing a categorisation of Planned Relocation, Adaptation In-Situ, and Lack of Adaptation. Second, planned relocation has traditionally been evaluated in terms of impacts on people's income and livelihoods, human rights, or place attachments. This study presents a distinctive analysis of government action and inaction by assessing affected individuals' wellbeing and perceptions of fairness. Wellbeing, as used here, is multidimensional, encompassing material, subjective, and relational dimensions. Perceptions of fairness, as used, here account for distributive and procedural dimensions. Third, there is limited evidence on how perceptions of fairness of outcomes and decision-making processes affect an individual's sense of wellbeing. This study, therefore, investigates the relationships between distributive and procedural aspects of fairness and subjective wellbeing. Overall, this study contributes to the fields of environmental justice and climate change adaptation by shedding light on the complex impacts of government action and inaction on wellbeing and perceptions of fairness among socially marginalised communities.

This study examines government action and inaction in the Ganges-Brahmaputra Delta in India. It focuses on localities on Sagar Island that are facing coastal erosion and flooding and where local populations recognise the need for government intervention but where there have been uneven government responses. A combination of inductive and deductive approaches is used to

identify theoretically valid yet locally relevant aspects of wellbeing and fairness. Data are derived from mixed methods, used both for the purpose of development and expansion. The data includes narrative interviews (n=14) that aim to identify valued aspects of wellbeing and fairness, as well as surveys (n=222) and semi-structured interviews (n=14) that aim to measure the wellbeing and perceptions of fairness in Relocated, Adapted In-Situ, and Non-Adapted sub-populations.

The results reveal that, on average, most Relocated respondents own agricultural land, which is a key factor in evaluations of material wellbeing among the three unevenly adapted sub-populations that traditionally relied on subsistence agriculture. Livelihoods reconstruction and diversification are central to self-assessments of material and subjective wellbeing, and perceptions of distributive fairness. Relocated respondents report the highest levels of subjective wellbeing across most life satisfaction dimensions and dual social attachments to the original and new settlement. The Relocated, Adapted In-Situ, and Non-Adapted respondents form their perceptions of fairness in relation to the distribution of beneficial and adverse outcomes, employing the criteria of equity, equality, and need inconsistently. Perceptions of procedural fairness vary, but overall expectations of government action are low. Perceptions of fairness have not been found to influence respondents' subjective wellbeing.

This study resonates with previous studies on planned relocation that place the issue of livelihoods as a key factor for successful adaptation. It demonstrates that when planned relocation improves material circumstances, the outcomes of the intervention are accepted and perceived as legitimate. Outcome satisfaction is the main criterion influencing the formation of perceptions of fairness. Pessimistic expectations of government intent and capacity combined with greater-than-expected government action are found to positively influence perceptions of fairness even in the absence of a participatory approach. This finding is distinctive from many studies that place participatory decision-making processes as central to the formation of perceptions of fairness. Considering the growing demand for planned relocation in response to climate change, these findings contribute to a

more comprehensive understanding of marginalised communities' expectations of adaptation.

## Table of Contents

Acknowledgements .....	2
Abstract .....	3
List of Tables .....	11
List of Figures.....	12
List of Images.....	15
Key Terms and Definitions .....	16
<b>Chapter 1. Introduction .....</b>	<b>19</b>
1.1 INTRODUCING THE RESEARCH PROBLEM.....	19
1.1.1 The relevance of planned relocation in academic and policy contexts ....	19
1.1.2 Planned relocation on the spectrum of government action and inaction ..	21
1.1.3 Wellbeing in government action and inaction .....	22
1.1.4 Perceptions of fairness in government action and inaction .....	23
1.1.5 The empirical application .....	25
1.2 RESEARCH QUESTIONS.....	26
1.3 THESIS OUTLINE .....	29
<b>Chapter 2. Theoretical and conceptual framework .....</b>	<b>31</b>
2.1 WELLBEING.....	32
2.1.1 Wellbeing: a concept of interest in social science disciplines and policy discourses .....	32
2.1.2 Multidimensional wellbeing.....	33
2.1.3 The non-universality of wellbeing dimensions.....	38
2.2 PERCEPTIONS OF FAIRNESS .....	40
2.2.1 Conceptualising fairness at the intersection of social, environmental and climate justice .....	40
2.2.2 Distinguishing between justice, fairness, and perceptions of fairness.....	41
2.2.3 Dimensions of justice: distributive, procedural, and recognition .....	42
2.2.4 Perceptions of distributive fairness .....	45
2.2.5 Perceptions of procedural fairness .....	46

2.2.6	How expectations of government affect perceptions of fairness .....	49
2.2.7	Why perceptions of fairness matter: acceptance, legitimacy, and subjective wellbeing .....	50
2.3	PLANNED RELOCATION .....	52
2.3.1	Planned relocation in the context of climate change .....	52
2.3.2	Planned relocation: a sign of adaptation or loss and damage? .....	54
2.3.3	Planned Relocation: a conceptual framework .....	57
2.3.4	Understanding the impacts of planned relocation .....	59
2.3.5	Planned relocation as climate change adaptation .....	61
2.3.6	Trapped populations? .....	63
2.4	THE STUDY'S CONTRIBUTION TO KNOWLEDGE .....	65
<b>Chapter 3. Methodology .....</b>		<b>69</b>
3.1	RESEARCH DESIGN AND APPROACH .....	69
3.1.1	Cross-sectional research design .....	69
3.1.2	A mixed-methods approach .....	71
3.1.3	The epistemology underpinning data collection and analysis .....	72
3.1.4	Combining deductive and inductive approaches .....	73
3.2.5	Empirical research structure .....	74
3.2.6	Ethical considerations .....	76
3.2	EMPIRICAL APPLICATION .....	77
3.2.1	Ganges-Brahmaputra Delta: its importance and relevance for this study ...	77
3.2.2	The political and institutional context of planned relocation in West Bengal	79
3.2.3	Sagar Island: an introduction to the fieldsite .....	81
3.3	DATA COLLECTION .....	89
3.3.1	Unit of analysis and sampling strategy .....	89
3.3.2	Methods .....	92
3.4	DATA ANALYSIS .....	99
<b>Chapter 4. The impact of government action and inaction on wellbeing</b>		<b>102</b>
4.1	VALUED ASPECTS OF WELLBEING .....	103
4.2	A COMPARISON OF WELLBEING BEFORE AND AFTER GOVERNMENT ACTION AND INACTION .....	106

4.2.1 A guidance on how to navigate the results sections on comparisons of wellbeing over time .....	106
4.2.2 Wellbeing before and after the Planned Relocation .....	108
4.2.3 Wellbeing before and after the Adaptation In-Situ .....	120
4.2.4 Wellbeing before and after the Lack of Adaptation .....	129
4.3 A COMPARISON OF WELLBEING BETWEEN RELOCATED, ADAPTED IN-SITU, AND NON-ADAPTED SUB-POPULATIONS .....	137
4.3.1 A guidance on how to navigate the results sections on comparisons of wellbeing across sub-populations .....	137
4.3.2 Material wellbeing .....	138
4.3.3 Subjective wellbeing .....	140
4.3.4 Relational wellbeing .....	151
4.4 SUMMARY OF FINDINGS .....	154
<b>Chapter 5. The impact of government action and inaction on perceptions of fairness .....</b>	<b>156</b>
5.1 VALUED ASPECTS OF FAIRNESS .....	157
5.2 PERCEPTIONS OF FAIRNESS .....	160
5.2.1 A guidance on how to navigate the results sections on perceptions of fairness .....	160
5.2.2 Relocated respondents' perceptions of fairness .....	161
5.2.3 Adapted In-Situ respondents' perceptions of fairness .....	166
5.2.4 Non-Adapted respondents' perceptions of fairness .....	173
5.3 A COMPARISON OF PERCEPTIONS OF FAIRNESS BETWEEN RELOCATED, ADAPTED IN-SITU, AND NON-ADAPTED SUB-POPULATIONS .....	177
5.3.1 A guidance on how to navigate the results sections on comparisons of perceptions of fairness .....	177
5.3.2 A comparison of perceptions of distributive fairness .....	179
5.3.3 A comparison of perceptions of procedural fairness .....	182
5.4 SUMMARY OF FINDINGS .....	188
<b>Chapter 6. How perceptions of fairness affect subjective wellbeing in uneven adaptation interventions .....</b>	<b>190</b>



6.1 THE RELATIONSHIP BETWEEN PERCEPTIONS OF FAIRNESS AND WELLBEING .	192
6.2 LACK OF CORRELATION BETWEEN PERCEPTIONS OF FAIRNESS AND SUBJECTIVE WELLBEING AS AN ARTEFACT OF THE STUDY DESIGN .....	195
6.2.1 Considerations on the study design.....	195
6.2.2 Fluctuations of wellbeing over time.....	197
6.3 PERCEPTIONS OF FAIRNESS IN SOCIALLY MARGINALISED COMMUNITIES .....	208
6.3.1 How local and regional governmental systems on Sagar Island inform perceptions of procedural fairness.....	208
6.3.2 How expectations of government inform perceptions of procedural fairness.....	212
6.3.3 How socio-economic and environmental circumstances inform perceptions of distributive fairness .....	215
6.4 A SUMMARY OF FINDINGS .....	219
<b>Chapter 7. Discussion.....</b>	<b>221</b>
7.1 SUMMARY OF EMPIRICAL RESULTS .....	221
7.2 AN EVALUATION OF RESULTS IN LIGHT OF EXISTING KNOWLEDGE.....	224
7.2.1 Improved livelihoods as a key to successful planned relocation .....	224
7.2.2 Successful planned relocation: beyond the matter of livelihoods .....	227
7.2.3 The importance of livelihood considerations in government action and inaction.....	228
7.2.4 A case where distributive justice trumps procedural justice: the role of expectations.....	230
7.2.5 Planned relocation as an adaptation strategy .....	233
7.2.6 Planned relocation: adaptation to climate change and Loss and Damage	236
7.3 ROBUSTNESS AND GENERALIZABILITY OF FINDINGS.....	238
7.3.1 The issue of data collection methods.....	238
7.3.2 The issue of novel results.....	239
7.4 POLICY RECOMMENDATIONS .....	241
7.4.1 Policy recommendations at the regional and national level .....	241
7.4.2 Policy recommendations at the international level.....	244
7.5 CONCLUSION .....	246
<b>Appendices .....</b>	<b>248</b>

APPENDIX 1. THE SURVEY .....	248
<b>Bibliography .....</b>	<b>261</b>

## List of Tables

<b>Table 2.1.</b> A typology of expectations of government action and inaction. Source: Chamlee-Wright and Storr (2010) .....	49
<b>Table 3.1.</b> The structure of the empirical research in three phases. ....	75
<b>Table 3.2.</b> The selection criteria for members of each of the three sub- populations: Relocated, Adapted In-Situ and Non-Adapted. ....	90
<b>Table 3.3.</b> Sampling technique and sampling size in relation to each data collection method. ....	91
<b>Table 3.4.</b> Socio-demographic characteristics of narrative interviews respondents. ....	94
<b>Table 3.5.</b> Socio-demographic characteristics of survey respondents. ....	97
<b>Table 3.6.</b> Socio-demographic characteristics of semi-structured interview respondents. ....	98
<b>Table 4.1.</b> Statistically significant differences in subjective wellbeing between Relocated, Adapted In-Situ and Non-Adapted sub-populations .....	142
<b>Table 5.1.</b> Statistically significant differences in perceptions of distributive and procedural fairness between Relocated, Adapted In-Situ and Non-Adapted sub-populations.....	178
<b>Table 6.1.</b> Correlation coefficients and statistical significance of associations between perceptions of fairness criteria and subjective wellbeing criteria. .....	194
<b>Table 6.2.</b> Wellbeing fluctuations across time in the Relocated sub-population. .....	199
<b>Table 6.3.</b> Wellbeing fluctuations across time in the Adapted In-Situ sub- population.....	203
<b>Table 6.4.</b> Wellbeing fluctuations across time in the Non-Adapted sub- population.....	206

## List of Figures

<b>Figure 2.1.</b> A representation of dimensions of justice. ....	45
<b>Figure 2.2.</b> The theoretical and conceptual framework of the study .....	66
<b>Figure 4.1.</b> Valued aspects of material, subjective and relational wellbeing. .	105
<b>Figure 4.2.</b> A comparison between past (indicated in black) and present (indicated in blue) material wellbeing in the Relocated sub-population. ...	109
<b>Figure 4.3.</b> A comparison between past (indicated in black) and present (indicated in blue) subjective wellbeing in the Relocated sub-population.	114
<b>Figure 4.4.</b> A comparison between past (indicated in black) and present (indicated in green) material wellbeing in the Adapted In-Situ sub- population.....	121
<b>Figure 4.5.</b> A comparison between past (indicated in black) and present (indicated in green) subjective wellbeing in the Adapted In-Situ sub- population.....	125
<b>Figure 4.6.</b> A comparison between past (indicated in black) and present (indicated in orange) material wellbeing in the Non-Adapted sub-population. .....	130
<b>Figure 4.7.</b> A comparison between past (indicated in black) and present (indicated in orange) subjective wellbeing in the Non-Adapted sub- population.....	133
<b>Figure 4.8.</b> A comparison of ‘Happiness’ in Relocated, Adapted In-Situ and Non Adapted sub-populations.....	141
<b>Figure 4.9.</b> A comparison of ‘Satisfaction with the natural environment’ in Relocated, Adapted In-Situ and Non Adapted sub-populations. ....	143
<b>Figure 4.10.</b> A comparison of ‘Satisfaction with work opportunities’ in Relocated, Adapted In-Situ and Non Adapted sub-populations. ....	144
<b>Figure 4.11.</b> A comparison of ‘Satisfaction with economic security’ in Relocated, Adapted In-Situ and Non Adapted sub-populations. ....	145
<b>Figure 4.12.</b> A comparison of ‘Satisfaction with food security’ in Relocated, Adapted In-Situ and Non Adapted sub-populations. ....	146
<b>Figure 4.13.</b> A comparison of ‘Satisfaction with drinking water’ in Relocated, Adapted In-Situ and Non Adapted sub-populations. ....	147

<b>Figure 4.14.</b> A comparison of ‘Satisfaction with health’ in Relocated, Adapted In-Situ and Non Adapted sub-populations.....	147
<b>Figure 4.15.</b> A comparison of ‘Satisfaction with housing’ in Relocated, Adapted In-Situ and Non Adapted sub-populations.....	148
<b>Figure 4.16.</b> A comparison of ‘Satisfaction with children’s education’ in Relocated, Adapted In-Situ and Non Adapted sub-populations. ....	149
<b>Figure 4.17.</b> A comparison of ‘Satisfaction with family relations’ in Relocated, Adapted In-Situ and Non Adapted sub-populations. ....	150
<b>Figure 4.18.</b> A comparison of ‘Satisfaction with community relations’ in Relocated, Adapted In-Situ and Non Adapted sub-populations. ....	150
<b>Figure 5.1.</b> Frequencies of perceptions of distributive fairness in the Relocated sub-population.....	161
<b>Figure 5.2.</b> Frequencies of perceptions of procedural fairness in the Relocated sub-population.....	164
<b>Figure 5.3.</b> Frequencies of perceptions of distributive fairness in the Adapted In-Situ sub-population. ....	167
<b>Figure 5.4.</b> Frequencies of perceptions of procedural fairness in the Adapted In-Situ sub-population. ....	171
<b>Figure 5.5.</b> Frequencies of perceptions of distributive fairness in the Non-Adapted sub-population. ....	173
<b>Figure 5.6.</b> Frequencies of perceptions of procedural fairness in the Non-Adapted sub-population. ....	175
<b>Figure 5.7.</b> A comparison of ‘Outcome satisfaction’ in Relocated, Adapted In-Situ and Non Adapted sub-populations.....	179
<b>Figure 5.8.</b> A comparison of ‘Equality’ in Relocated, Adapted In-Situ and Non Adapted sub-populations.....	180
<b>Figure 5.9.</b> A comparison of ‘Need’ in Relocated, Adapted In-Situ and Non Adapted sub-populations.....	181
<b>Figure 5.10.</b> A comparison of ‘Equity’ in Relocated, Adapted In-Situ and Non Adapted sub-populations.....	182
<b>Figure 5.11.</b> A comparison of ‘Participation’ in Relocated, Adapted In-Situ and Non Adapted sub-populations. ....	183

<b>Figure 5.12.</b> A comparison of 'Voice' in Relocated, Adapted In-Situ and Non Adapted sub-populations.....	183
<b>Figure 5.13.</b> A comparison of 'Consideration' in Relocated, Adapted In-Situ and Non Adapted sub-populations. ....	185
<b>Figure 5.14.</b> A comparison of 'Process control' in Relocated, Adapted In-Situ and Non Adapted sub-populations. ....	185

## List of Images

- Image 3.1.** Map of India and the Bay of Bengal (A); map of the Bay of Bengal and the Ganges-Brahmaputra Delta (B); and map of Sagar Island (C) ..... 82
- Image 3.2.** A typical dwelling and pond that was given to Relocated individuals in the first stages of the Planned Relocation (left) and the inside of the dwelling (right)..... 84
- Image 3.3.** View from a dwelling on the coast of Ghoramara Island (left) and the inside of the dwelling (right)..... 85
- Image 3.4.** The embankment in Beguakhali (left) and the area between Beguakhali and Dhablat where the embankment ends (right)..... 87
- Image 3.5.** Dwelling on the coastal area of Dhablat that has been damaged by floods and recurrent storms (left) and the coastal embankment in Dhablat (right)..... 88

## Key Terms and Definitions

Across disciplines, several terms are used interchangeably to describe different forms of risk, vulnerability, adaptive capacity, and adaptation interventions in the context of environmental change. For the purpose of this thesis, a list of key terms and definitions is set to ensure clarity and consistency throughout.

<b>Term</b>	<b>Definition</b>
Environmental risks	The term 'environmental risks' refers to slow-onset disasters (e.g. coastal erosion, salinity intrusion) and rapid-onset disasters (e.g. storms, floods, landslides).
Adaptation	The term 'adaptation' refers to actions taken with the aim to prepare for or adjust to both current and potential future environmental risks.
Adaptive capacity	The term 'adaptive capacity' refers to the ability of a person to adapt to environmental risks by moderating or avoiding potential harm or loss, exploiting beneficial opportunities, or coping with the consequences.
Vulnerability	The term 'vulnerability' refers to an entity's combined exposure to environmental risks and limited adaptive capacity.
Government action and inaction	The term 'government action and inaction' refers to government interventions and lack thereof in the context of adaptation to environmental risks. 'Government action' refers to government-led adaptation interventions with the stated aim of adapting



vulnerable populations to the adverse effects of environmental risks. 'Government inaction' refers to a lack of government-led adaptation interventions for vulnerable populations experiencing the adverse effects of environmental risks.

Unevenly adapted populations The term 'unevenly adapted populations' refers to populations that have been the subject of uneven government action and inaction in the context of adaptation to environmental risks.

Planned Relocation The term 'planned relocation' refers to a planned government-led action in which persons or groups of persons are assisted to move away from their homes or places of temporary residence, are settled in a new location and provided with the conditions for rebuilding their lives. Specifically, 'Planned Relocation' is used here to refer to the government-led action in which inhabitants from the coastal areas of Lohachara Island and Ghoramara Island have been relocated to Sagar Island.

Relocated The term 'Relocated' refers to persons or groups of persons that the Indian State authorities have relocated from the coastal areas of Lohachara Island and Ghoramara Island to Sagar Island.

Adaptation In-Situ The term 'adaptation in-situ' refers to a government-led action in-situ with the stated

aim to reduce or eliminate the exposure or sensitivity of persons or groups of persons to environmental risks. Specifically, 'Adaptation In-Situ' is used here to refer to the government-led action in which inhabitants from the coastal areas of Sagar Island (Beguakhali) have been adapted in-situ through the construction of an embankment.

#### Adapted In-Situ

The term 'Adapted In-Situ' refers to persons or groups of persons that the Indian State authorities have adapted to environmental risks in-situ, through the construction of an embankment.

#### Lack of Adaptation

The term 'lack of adaptation' refers to a governmental lack of action in adapting vulnerable persons or groups of persons to environmental risks. Specifically, 'Lack of Adaptation' is used here to refer to a lack of government-led action for some coastal inhabitants of Sagar Island (Dhablat), leaving them exposed to environmental risks.

#### Non-Adapted

The term 'Non-Adapted' refers to persons or groups of persons that the Indian State authorities have not adapted to environmental risks.

# Chapter 1. Introduction

## 1.1 Introducing the research problem

This thesis examines the consequences of planned relocation, alongside other forms of government action and inaction, in the context of climate change adaptation by expanding the scope of analysis to incorporate multiple dimensions of wellbeing and fairness. Whilst evaluations of planned relocation commonly focus on the risks and benefits of government intervention, they often overlook the impacts of uneven government action and inaction. This study, therefore, focuses on planned relocation and compares it with interventions for adaptation in-situ and circumstances without intervention.

The study consists of three parts. The first part assesses the consequences of government action and inaction – namely Planned Relocation, Adaptation In-Situ, and Lack of Adaptation – on wellbeing. Wellbeing, as used here, is multidimensional, encompassing material, subjective, and relational dimensions. The second part examines how the decision-making processes (procedural justice) and outcomes (distributive justice) influence perceptions of fairness in the three unevenly adapted sub-populations. Perceptions of fairness, as used here, refer to the social acceptability of unequal processes and outcomes. The third part establishes whether and, if so, how perceptions of fairness affect individuals' wellbeing. To conduct the proposed inquiry, this study draws on three main areas of study, (i) social psychology, (ii) environmental justice and, (iii) climate change adaptation.

### 1.1.1 The relevance of planned relocation in academic and policy contexts

**Planned relocation is a topic of academic and transdisciplinary importance, making this study particularly timely and relevant.** Planned relocation is “*a planned process in which persons or groups of persons are assisted to move away from their homes or places of temporary residence, are settled in a new location and provided with the conditions for rebuilding their lives*” (UNHCR, 2015,

p.5). The study and practice of planned relocation in its modern form have primarily focused on the movement of people to make way for infrastructure and development projects, especially dam construction (Cernea, 1997, 2008; Cernea and McDowell, 2000; McDonald-Wilmsen, 2009; Oliver-Smith, 1991, 2005; Stanley, 2004; Terminski, 2013, 2015; Vanclay, 2017). This form of planned relocation is widely known as Development-Induced Displacement and Resettlement. The impetus of planned relocation in policy and academic arenas has been renewed with the realisation that climate change might render places too unsafe for continued human habitation (IPCC, 2014).

Human mobility in the form of migration, displacement, and immobility is taking place around the world where populations are exposed to increasing environmental risks and have different adaptive capacity (Black et al., 2011, 2013a; Connel and Coelho, 2018; Raleigh and Jordan, 2010; Richards and Bradshaw, 2017; Tacoli, 2009, 2011; Warner et al., 2010). However, it is important to note that human mobility has historically played an important role in the survival and livelihood resilience of populations (Barnett and McMichael, 2018; Castles, 2008; Sheller and Urry, 2006). Whilst many will migrate or be displaced, others with more limited adaptive capacity will be unable to leave places where environments are severely degrading, and exposure to environmental risks is becoming more severe. It seems likely that the poorest, most marginalised people are at the greatest risk of being or becoming immobile populations (Black et al., 2013b; Cundill et al., 2021). In this context, planned relocation is seen as a measure of last resort to help adapt individuals to the effects of climate change (Hino et al., 2017; Warner, 2010).

With the increasing impacts of anthropogenic climate change on ecosystem services, natural resources, and the habitability of certain areas (IPCC, 2014, 2022), planned relocation is now discussed as a necessary or potentially effective intervention for vulnerable communities (Ferris, 2011, 2015; Ferris and Weerasinghe, 2020; Hino et al., 2017; McAdam and Ferris, 2015). Planned relocation is included in the United Nations Framework Convention on Climate Change as a form of government action that might qualify for future adaptation

funding (UNFCCC, 2010). Some researchers call for states to begin to develop national and local frameworks on planned relocation (Ferris and Weerasinghe, 2020). However, the relationship between climate change and planned relocation is contested, with some arguing that the narrative of climate change-induced risks can be used as a justification for planned relocation that is instead pursued for political or economic gain (Arnall, 2014; Barnett and Webber, 2009). Others also claim that moving away from one's homeland in response to climate change impacts constitutes loss and damage and thus should be seen as an adaptation failure (Heine and Petersen, 2008; Raleigh and Jordan, 2010). Nonetheless, planned relocation in response to climate change impacts has been enforced in some parts of the world, such as India (Danda et al., 2019; Mortreux et al., 2018), Vietnam (Chun, 2014; de Sherbinin et al., 2011b), Alaska (Bronen, 2008, 2010), Mozambique (Arnall, 2013a; de Sherbinin et al. 2011b), Mongolia (Rogers and Wang, 2006), Solomon Islands (Albert et al., 2018), Fiji (Barnett and McMichael, 2018; Charan et al., 2017; Martin et al., 2018; McMichael et al., 2018, 2019), and Papua New Guinea (Connell, 2016; Lipset, 2013).

### **1.1.2 Planned relocation on the spectrum of government action and inaction**

**This study presents a comparative assessment of government action and inaction in response to environmental risks.** There are international protocols and regulations to guide planned relocation (Ferris and Weerasinghe, 2020; Tilt et al., 2009), which emerged in response to a long history of human rights violations associated with Development-Induced Displacement and Resettlement and planned relocation (Baird and Shoemaker, 2007; Bronen, 2011; Maldonado et al., 2013; Warner et al., 2013). However, international protocols are known to be a weak instrument when contending with political interests of individual states (Ferris and Weerasinghe, 2020). The decision on whether to relocate individuals and communities is often ad hoc, with responses ranging from the planned relocation of entire communities away from areas at risk to a lack of government intervention (Mortreux et al., 2018).

Climate change adaptation responses can be seen along a spectrum, with governments sometimes choosing to enforce planned relocation, other times adapting populations in-situ, and other times choosing not to intervene. Where governments decide not to intervene, evidence from studies on migration and environmental risks highlight two main outcomes: first, those who have the means to migrate will do so to safeguard themselves from environmental risks or to maintain or improve socio-economic wellbeing (Renaud et al., 2011), and second, those with limited access to resources and networks may be unable to escape deteriorating environmental conditions, effectively becoming trapped in place, and reinforcing conditions of vulnerability (Black et al., 2013b; Black and Collyer, 2014; Milan and Ruano, 2014). Although the full range of government action and inaction is apparent, studies on planned relocation focus almost entirely on those situations where interventions occur (Warner et al., 2013). There are, therefore, calls to improve understanding of different approaches to climate change adaptation by conducting comparative analyses in developing countries (Koenig, 2005).

### **1.1.3 Wellbeing in government action and inaction**

**This thesis presents a comprehensive study of wellbeing in government action and inaction.** It expands the scope of previous research by accounting for material, subjective, and relational dimensions as well as changes in wellbeing across time and space. The existing evidence on planned relocation has so far addressed impacts on livelihoods (Arnall, 2013a; Chun, 2014; Nicholls et al., 2016; Kura et al., 2017), potential frameworks based on human rights doctrine (Bronen, 2008, 2011; Bronen and Chapin, 2013; Gromilova, 2014; Maldonado et al., 2013), social justice implications (Siders, 2019), repercussion on place attachment, identity and resilience (Adams and Adger, 2013; Adams, 2016; Agyeman et al., 2009; Miller, 2020; Speller, 2000), and its transformative potential (Siders et al., 2021). The literature shows that relocated populations are particularly affected by the issue of livelihoods; in fact, the restoration of livelihoods is seen as a key factor in determining whether a planned relocation

initiative is successful (Arnall, 2013a; Ngenyam Bang and Few, 2012). When the restoration of livelihoods is seen as uncertain in a new place, people have been found to resist planned relocation. To understand the overall effectiveness of planned relocation, however, there is a need to move away from the economic focus of livelihood rehabilitation (Mathur, 2013) and account for other relevant aspects that contribute to people's wellbeing.

Whilst many studies focus specifically on livelihoods or the objective material aspects of wellbeing, this study recognises the complex nature of wellbeing dimensions and their interrelatedness. The social conception of wellbeing that underlies this study recognises three dimensions – material, subjective, and relational – for which there is growing theoretical consensus (Boarini et al., 2014; McGregor et al., 2015a; White, 2010). The wellbeing of people is bound to place and thus dependent on the geography of the place both in terms of environmental quality and cultural significance (Altman and Low, 1992; Rollero and DePiccoli, 2010). Therefore, people living in areas severely affected by climate change and subject to uneven adaptation interventions can experience adverse wellbeing impacts. For planned relocation to be an effective government intervention, understanding the impacts it has on people's wellbeing is imperative.

#### **1.1.4 Perceptions of fairness in government action and inaction**

**This study assesses perceptions of distributive and procedural fairness in government action and inaction.** Traditionally, fairness in climate justice has been explored in terms of who causes climate change, who benefits and loses from climate change impacts, and who is responsible for mitigation and adaptation (Adger, 2006; Barrett, 2013; Markowitz et al., 2015; Schlosberg and Collins, 2014). It has since expanded to account for fairness in adaptation at local levels as environmental risks and climate change adaptation strategies are more acutely experienced at local levels (Adger et al., 2006; Cutter et al., 2012). Whilst government responses have been facilitating the planned relocation of vulnerable populations away from areas at risk, there is an ongoing uncertainty as to whether

these forms of government action do, in fact, promote fairness and equality (Arnall, 2019a; Miller, 2020). Government action and inaction at local levels consists of decision-making processes and outcomes, which raise distributive and procedural fairness concerns.

Fairness needs not only to be done but to be seen to be done (Adger et al., 2016). Hence a key issue in climate change adaptation is how individuals perceive fairness (Hamilton, 2018). Drawing on conceptualisations from the fields of social, environmental, and climate justice, fairness is seen here as the social acceptability of unequal processes and outcomes (Adger et al., 2016; Forsyth, 2014). These perceptions of fairness matter because they have the capacity to affect the acceptance of outcomes and the legitimacy of state-society relations (Adger et al., 2016). Negative perceptions of distributive fairness have been found to lead to divided communities and a decrease in social wellbeing (Gross, 2007). Perceptions of procedural fairness have been found to be a key factor in the overall effectiveness of environmental governance (Berardo, 2013; Leach and Sabatier, 2005; MacCoun, 2005; Resh et al., 2014; Siddiki and Goel, 2017). These ethical and practical issues have led to calls for a deeper understanding of perceptions of fairness in climate change policy (Klinsky et al., 2016).

From an ethical perspective, perceptions of fairness underpin people's ideas of flourishing or suffering (Lau et al., 2021a). Perceptions of procedural justice have been shown to influence subjective wellbeing (Lind and Tyler, 1988; Narayan, 2000; Sayer, 2011; Tyler, 2015;). On the one hand, fair policies tend to instil a sense of wellbeing and satisfaction among affected individuals; on the other hand, policies that are perceived as unfair can lead to negative repercussions on wellbeing, overall dissatisfaction, and lack of acceptance and compliance with policies (Maiese and Burgess, 2020). Research on the relationship between perceptions of policies and subjective wellbeing is limited in the literature on climate change adaptation. **This study seeks to address this knowledge gap by advancing the understanding of how perceptions of fairness of government action and inaction affect subjective wellbeing.**



### **1.1.5 The empirical application**

Empirically, this study looks at contemporary settings to observe and collect data on government action and inaction in the context of climate change, namely Planned Relocation, Adaptation In-Situ, and Lack of Adaptation. These settings are based in the Ganges-Brahmaputra Delta, India. Low-lying coastal zones in dynamic environments, such as deltas, are particularly interesting areas of study as the biophysical and socio-economic challenges that people face are exacerbated by climate change impacts (Dastagir, 2015; Rahman et al., 2020). The Ganges-Brahmaputra Delta is a socio-ecological system highly exposed to climate hazards, including coastal flooding, tropical cyclones, and storm surges, causing high rates of coastal erosion and salinity intrusion; yet, it is also a place offering many livelihood opportunities and where there is a high population density (Ghosh et al., 2014; Giosan et al., 2014; Renaud et al., 2013; Tessler et al., 2015).

The primary data collection is conducted in Sagar Block (a community development block), on the Southwest of the Ganges-Brahmaputra Delta, an area with a history of significant environmental displacements and planned relocations due to land use change and environmental degradation (Danda et al., 2019; Mortreux et al., 2018). The islands of the Sagar Block – Lohachara Island, Ghoramara Island, and Sagar Island – are exposed to mangrove loss and sea level rise, coastal flooding, storm surges, and cyclones, leading to high rates of coastal erosion and salinity intrusion (Ghosh et al., 2014). Communities living here are not only exposed to environmental risks but also have limited capacity to adapt. The Human Development Measures across the region remain low, with 34% of the population below the poverty line, 59% without access to clean drinking water, and 47% living with some food shortage (Centre for Sciences and Environment (CSE) et al., 2016). Such vulnerable communities find themselves in need of government assistance.

Government responses, however, have been uneven. The government has supported the planned relocation of those displaced by coastal erosion from Lohachara Island and Ghoramara Island to Sagar Island. On other parts of Sagar

Island, the government has chosen either to adapt communities in-situ by investing in large-scale coastal embankments or not to intervene (Mortreux et al., 2018). These three types of communities – Relocated, Adapted In-Situ, and Non-Adapted – are the focus of this comparative study.

The results of such inquiry aim to address the identified knowledge gaps in the literature on climate change adaptation, specifically on planned relocation. By investigating the impacts of government action and inaction in the context of climate change in terms of wellbeing and perceptions of fairness, the study contributes to the growing literature on multidimensional wellbeing, academic debates on environmental justice and policy debates regarding planned relocation and climate change adaptation strategies. Planned relocation will become increasingly common as climate change increases the frequency and intensity of environmental risks, degrades essential ecosystem services and livelihood options, and renders areas uninhabitable. This makes understanding how to plan and implement fair planned relocation in a way that promotes wellbeing highly relevant and timely.

## **1.2 Research Questions**

This study explores the impacts of government action and inaction on wellbeing and perceptions of fairness and the relationship between these two concepts. The study's conceptual framework includes the multidimensional notion of wellbeing (including material, subjective, and relational dimensions) and perceptions of fairness (including distributive and procedural dimensions). The empirical component of the study is organised around three questions and several sub-questions:

1. How is the wellbeing of populations exposed to environmental risks affected by government action and inaction?

1.1 What aspects of wellbeing are valued by the three unevenly adapted sub-populations?

1.2 How is government action and inaction affecting the material, subjective, and relational wellbeing of the three unevenly adapted sub-populations?

1.3 How does wellbeing compare among the three unevenly adapted sub-populations?

The first research question aims to evaluate the wellbeing of unevenly adapted sub-populations: Relocated, Adapted In-Situ, and Non-Adapted. First, it sets out to develop a contextual understanding of what it means to live a good life by identifying wellbeing aspects that are valued by the three unevenly adapted sub-populations. A list of wellbeing criteria that is theoretically valid and locally relevant is established through a combination of literature review and narrative interviews. These criteria are then used to investigate the wellbeing of unevenly adapted sub-populations through surveys and semi-structured interviews. Second, drawing from the surveys and semi-structured interviews, past and present wellbeing data for the three unevenly adapted sub-populations is presented. This comparison within sub-populations offers insight into how government action and inaction affect wellbeing. Third, a wellbeing comparison across the three unevenly adapted sub-populations in the present time is presented. This comparison between sub-populations provides an evaluation of which form of adaptation intervention has the most positive impact on wellbeing.

2. How is government action and inaction perceived by the three unevenly adapted sub-populations in terms of fairness?

2.1 What aspects of fairness are valued by the three unevenly adapted sub-populations?

2.2 How is government action and inaction affecting the perceptions of distributive and procedural fairness of the three unevenly adapted sub-populations?

2.3 How do perceptions of fairness compare among the three unevenly adapted sub-populations?

The second research question aims to evaluate the perceptions of fairness of unevenly adapted sub-populations. First, a contextual understanding of what fairness aspects are valued by the three unevenly adapted sub-populations is presented. A list of fairness criteria that is theoretically valid and locally relevant is identified through a combination of literature review and narrative interviews. These criteria are then used to investigate the perceptions of fairness of unevenly adapted sub-populations through surveys and semi-structured interviews. Second, drawing from the surveys and semi-structured interviews, data on perceptions of distributive and procedural fairness for each of the three unevenly adapted sub-populations is presented. The aim is to assess how Relocated, Adapted In-Situ, and Non-Adapted respondents perceive the decision-making processes and outcomes of the Planned Relocation, Adaptation In-situ, and Lack of Adaptation, respectively. Third, a comparison of perceptions of fairness across the three unevenly adapted sub-populations is presented. This comparison provides an evaluation of which form of adaptation intervention is perceived as most fair.

3. Do perceptions of fairness influence the wellbeing of the three unevenly adapted sub-populations?

The third research question aims to establish whether there is a relationship between individuals' perceptions of fairness and their subjective wellbeing. First, correlations between perceptions of distributive and procedural justice are described. Second, a justification of the results in terms of the study design through an assessment of fluctuations of wellbeing in time is presented. Third, considerations on how expectations of government intent and capacity, local and regional legislative systems, as well as socio-economic and environmental circumstances, influence the formation of perceptions of fairness are put forward.

### **1.3 Thesis outline**

This thesis is comprised of seven chapters.

Chapter 2 presents this study's framework drawing on theoretical, conceptual, and empirical work from social psychology, environmental justice, and climate change adaptation literature. First, wellbeing is presented as a multidimensional construct including material, subjective, and relational dimensions. Second, distributive and procedural justice and the formation of perceptions of distributive and procedural fairness is discussed. Third, the literature on planned relocation within the spectrum of government action and inaction in the context of climate change adaptation is presented. The fourth section highlights this study's contribution to knowledge in reference to well-identified knowledge gaps and justifies the three main research questions.

Chapter 3 presents a detailed account of how this study aims to answer the research questions. It first outlines the empirical application of the study and details the importance and relevance of studying government action and inaction in the Ganges-Brahmaputra Delta, India. It then describes the selection of the research design, approach, data collection and data analysis methods. These choices are justified by describing their suitability in answering the research questions and their application in similar empirical studies. Ethical considerations are also presented.

Chapter 4 presents the results of the first research question. It starts with assessing locally valued material, subjective and relational wellbeing aspects, ultimately supporting the literature on multidimensional wellbeing. Drawing on quantitative and qualitative data, results on wellbeing before and after the Planned Relocation, before and after the Adaptation In-Situ and before and after the exposure to environmental risks (Lack of Adaptation) are presented across all three wellbeing dimensions. A comparative assessment of wellbeing across the three unevenly adapted sub-populations is also presented.

Chapter 5 presents the results of the second research question. It starts by introducing aspects of fairness that are valued by the local sub-populations.

Drawing on quantitative and qualitative data, results on perceptions of distributive and procedural perceptions of fairness in government action and inaction are presented. A comparative assessment of perceptions of fairness across the three unevenly adapted sub-populations is also provided.

Chapter 6 presents the results of the third research question. It starts by evaluating the impacts of perceptions of fairness on subjective wellbeing. It then justifies the results first as an artefact of the study design and second as the result of the formation of perceptions in socially marginalised communities. It puts forward considerations on how perceptions of fairness can be influenced by local and regional governmental systems, expectations of government intent and capacity, as well as people's socio-economic and environmental circumstances.

Chapter 7 presents a discussion of the findings presented in Chapter 4, Chapter 5 and Chapter 6 in relation to the framework put forward in Chapter 2. The discussion includes considerations of the novel findings in relation to the existing literature on planned relocation and highlights how these findings contribute to the identified knowledge gaps. The robustness and generalizability of these results is assessed. The implications of these findings for planned relocation policy at local, national, and international levels are highlighted.

## **Chapter 2. Theoretical and conceptual framework**

The central focus of this study is the successful adaptation of vulnerable and marginalised communities to the impacts of climate change. Whilst this study focuses primarily on planned relocation, this is considered along the spectrum of government action and inaction. Therefore, a comparative assessment of Planned Relocation, Adaptation In-Situ, and Lack of Adaptation is proposed. Research on government adaptation interventions, and specifically studies on planned relocation, have extensively focused on livelihood impacts. Research on justice in climate change contexts has primarily focused on who causes climate change, who benefits and loses from climate change impacts, and who is responsible for mitigation and adaptation, only recently expanding its scope to focus on fairness in adaptation interventions at local levels. A comprehensive understanding of government action and inaction in the context of climate change would benefit from more in-depth research into wellbeing impacts and more attention to social and environmental justice considerations.

Therefore, this study aims to contribute to these knowledge gaps by applying a novel combination of wellbeing and justice theory. This chapter aims to present this theoretical and conceptual framework in four parts. First, a review of wellbeing literature that informs a comprehensive conceptualisation of multidimensional wellbeing – including material, subjective, and relational dimensions – is presented. Second, the intersection of social, environmental, and climate justice informs the conceptualisation of perceptions of fairness as the social acceptability of unequal outcomes (distributive justice) and processes (procedural justice). Third, drawing from the climate change adaptation and the loss and damage bodies of literature, an overview of current research into planned relocation and other government responses in the context of climate change is presented. Fourth, the identified research gaps and the ways this study aims to address them are described. Here, the novel contribution to knowledge is clearly explained.

## **2.1 Wellbeing**

### **2.1.1 Wellbeing: a concept of interest in social science disciplines and policy discourses**

Wellbeing is a concept of interest across many social science disciplines as well as policy discourses (Gough et al., 2007). In 2001, the Millennium Ecosystem Assessment (MEA) positioned the relationship between human wellbeing and ecosystems firmly at the centre of the agenda for academics and policymakers. This led to extensive debates on the contribution of ecosystems to human wellbeing and the consequences of ecosystem changes on human wellbeing (Breslow et al., 2016, 2017; Dawson and Martin, 2015). In particular, the relationship between climate change impacts on ecosystems and, consequently, on human wellbeing became the focus of much research (Naeem et al., 2009; MEA, 2005; Pecl et al., 2017).

In 2005, The Commission on the Measurement of Economic Performance argued that to achieve sustainable and inclusive development, the major systems of statistical data collection should be redirected, from the measurement of progress in terms of production and consumption to the measurement of progress in terms of human wellbeing (Stiglitz et al., 2009). This led to an array of wellbeing research advocating for its use as a direct measure of policy impact on people's lives (Helliwell, 2003; McGregor, 2014; OECD, 2013). Others have also argued for its use in policy design and implementation processes so that development or climate change adaptation policies, for example, can align with the wants and needs of citizens (Boarini et al., 2014; McGregor et al., 2009). These considerations put the individual at the centre of both outcomes and processes of policymaking.

Regarding this, Boarini et al. (2014) argued that participatory processes have the potential to enhance the acceptance of outcomes and the legitimacy of policies. Therefore, policies that aim to improve people's lives should be developed through participatory processes where those affected are part of the decision-making processes and their wants and needs are used to inform the aims of



policy outcomes (Hall and Rickard, 2013). The literature on international development focused extensively on the importance of accounting for poor people's knowledge, understandings, and aspirations (Chambers, 1983; Narayan, 2000). This shifted the poverty debate from a narrow focus on objective dimensions of poverty (predominantly income poverty) to encompass people's subjective perceptions of what they need and want (Gough et al., 2007; Narayan, 2000). These developments in social science research and the policy arena led to a departure from objective income-based notions of wellbeing to account for a holistic assessment of people's lives (Douglas and Ney, 1998; McGregor and Pouw, 2017).

Assessments of wellbeing in social science research describe it as dynamic (McGregor, 2004), socio-culturally and ecologically embedded (Balmford and Bond, 2005; MEA, 2005), person-specific (Sen, 1985), gendered (Narayan et al., 2000), and reliant on people's resources, agency, and pursuit of the desired living standard within their local context (McGregor, 2004; Narayan et al., 2000, Sen, 1985). The breadth of the literature on wellbeing shows the evolution of the idea of what constitutes wellbeing (Brown and Westaway, 2011), from a narrow focus on objective indicators of material conditions (income, food and housing) and social attributes (health and education), to a focus on 'subjective wellbeing', 'quality of life' and 'life satisfaction' (Cummins, 1996; Ryan and Deci, 2001; Michalos, 1997; Veenhoven, 2000), and ultimately on subjective evaluations of multidimensional social indicators (McGregor, 2007).

### **2.1.2 Multidimensional wellbeing**

The use of the concept of wellbeing across different disciplines and areas of interest leads to numerous ideologies, conceptualisations, and methodologies that underpin various initiatives to measure progress, quality of life, and happiness (McGregor et al., 2015a, 2015b). However, no universally accepted definition has been established (Brown and Westaway, 2011; McGillivray and Clarke, 2006). The conceptualisation of wellbeing that underlies this study draws

from the findings of the ESRC (Economic and Social Research Council) 'Wellbeing in Developing countries' (WeD) project. Wellbeing is here defined as a *"state of being with others which arises when human needs are met, where one can act meaningfully to pursue one's goals and where one can enjoy a satisfactory quality of life"* (McGregor, 2008, pp. 4).

This definition recognises wellbeing as a multidimensional construct for which there is growing theoretical consensus (Boarini et al., 2014; Stiglitz et al., 2009; White, 2010). It considers the (i) material conditions of people, (ii) their subjective assessments of their lives, and (iii) their social relationships (Adler and Seligman, 2016; Gough et al., 2007; White, 2017). McGregor and Pouw (2017) highlight that no single dimension can measure the extent to how well a person is doing in their life; they argue that the interconnectedness of the three dimensions is what generates wellbeing for people. If wellbeing is to be comprehensive in its relevance for climate change adaptation policy these three dimensions need to be accounted for (McGregor and Sumner, 2010). A social approach to human wellbeing contends that for public policy purposes, it is important to account for material and subjective wellbeing (McGregor et al., 2009), as well as to recognise that what is achieved materially, and the experience of it, is socially constructed (Deneulin and McGregor, 2010).

These dimensions, however, are not in a fixed state of human existence but ever-changing in space and time. People's perceptions of their own wellbeing in the present time are influenced by reflections on their past, and expectations of their future, and vice versa, the way people experience their present lives affects the way they perceive their past and future (White, 2010). These subjective evaluations are also rooted in space, with personal understandings and abilities to achieve wellbeing depending critically on the geography of the space they live in, both in terms of environmental quality and cultural significance (Altman and Low, 1992; Rollero and DePiccoli, 2010).

## **a) Material wellbeing**

Material wellbeing refers to the material circumstances of a person's life (McGregor and Sumner, 2010), which have traditionally been assessed in terms of wealth and income (OECD, 2011). Wealth is a 'stock' concept that encompasses, whether at the individual or household level, the value of accumulated assets such as property or household goods at a given time (OECD, 2011). Wealth indicators are used, for example, to investigate poverty in developing countries (McGregor and Sumner, 2010). Income, whether at the individual or household level, refers to the flow of economic resources over time and includes all financial earnings (OECD, 2011). This is the most commonly used proxy for material wellbeing.

Whilst material wellbeing is a fundamental part of any notion of wellbeing, the multidimensional conceptualisation that underlies this study frames the material, social, and cultural as intrinsically intertwined. In this context, one must account for more than income to understand a person's wellbeing. This goes against the standard hypothesis in microeconomics, which states that the availability of a broader number of choices is a result of income, and the ability to select preferential outcomes is a means of maximising wellbeing (Kahneman, 2003; Schwartz, 2004). Many economic strategies by governments assume that economic growth automatically leads to increased wellbeing, but the evidence on this is mixed, especially for countries with high inequality (Costanza et al., 2009; Forgeard et al., 2011). Research shows an association between material and subjective wellbeing, but this association is limited (Biswas-Diener and Diener, 2001; Easterlin et al., 2010). As Camfield et al. (2010) argue, although income is an important factor to a person's wellbeing, it cannot be an indicator of a person's overall wellbeing.

When assessing material wellbeing, its interrelatedness to ecosystem services should be recognised (Abunge et al., 2012; Mooney et al., 2005). Recognizing the interrelatedness of the natural environment to human wellbeing is important, particularly for poor people whose food security and livelihoods are dependent on the exploitation of natural resources (Bidaud et al., 2017; Duraiappah, 2004)

and are, therefore, more vulnerable to environmental change (Adger, 2000). This is shown in the context of small-scale fishers in coastal Bangladesh (Hossain et al., 2016) and pastoralists in sub-Saharan Africa (Homewood et al., 2019), among others. Arnall et al. (2013a) also highlight the importance of accounting for the availability of agricultural land, especially when assessing wellbeing in communities that rely on subsistence agriculture. This study's approach is to collect a heterogeneous set of indicators that, when analysed together, provide a comprehensive understanding of material circumstances.

## **b) Subjective wellbeing**

The subjective dimensions of wellbeing account for how people feel about their lives and what people value and desire. Hedonism (a central philosophy of psychological wellbeing) equates wellbeing to happiness and pleasure, recognising the importance of both physical pleasures and valued outcomes that lead to happiness (Kahneman et al., 1999). Hedonic psychological research focuses on how human happiness can be maximised and seeks to measure wellbeing in terms of pleasure versus pain. Many evaluative measures of the pleasure/pain continuum exist, with subjective wellbeing being the most popular tool.

Subjective wellbeing is defined as *“the subjective evaluation of the quality of one's life involving both the presence of positive emotions, absence of negative emotion and cognitive evaluations of life satisfaction”* (Diener, 1984, pp. 555). Subjective wellbeing encompasses both affective (how people feel) and cognitive (what people think) aspects (Diener et al., 2003; Veenhoven, 1995). The affective component of hedonic wellbeing consists of positive and negative moods and emotions (Watson et al, 1988). It posits that increased pleasure and decreased pain leads to happiness. Whilst some happiness economists (e.g. Layard, Oswald and Frey) propose that a single happiness score is a good proxy variable for subjective wellbeing, others argue that a single score cannot adequately capture the underlying complexity of people's judgements about the quality of

their lives (McGregor et al., 2015). The cognitive component of hedonic wellbeing, often referred to as life satisfaction, is an evaluative process in which individuals assess the quality of their life based on their own set of criteria (Pavot and Diener, 1993), and thus rely on an idiosyncratic set of standards (Campbell et al., 1976; McGregor and Pouw, 2017). This study conceptualises subjective wellbeing as a composite of the two underlying concepts of happiness and life satisfaction.

### **c) Relational wellbeing**

Relational wellbeing recognises that wellbeing is pursuit in relation to other people (Gough and McGregor, 2007; McGregor and Pouw, 2017; Woodhouse et al., 2015). The importance of relational factors is proved by standard numerical indices of wellbeing, which associate low quality of life with social exclusion and personal isolation and high quality of life with social connectedness (Campbell et al. 1976 in Offer, 2008). Wellbeing, however, is not a fixed state of human existence nor an attribute that can be acquired or lost over time, but rather a dynamic process that can be experienced in multiple relations, such as communities and culture (Helne and Hirvilammi, 2015). Relations can be explored through the notion of 'culture', with subjects seen as forms within a specific social and cultural context (Gough and McGregor, 2007).

Recognizing the centrality of relatedness in the construction of people and their wellbeing requires paying attention to social structures and power relations, such as the hierarchical nature of family relations or the aggregate level differences between age, gender, race, and class (White, 2017). These structures and power relations remain important predictors of differences in opportunities and wellbeing. What wellbeing entails depends not only on the psychological outlook one has in life, but equally on the position in society and the society one lives in. This study recognises the idea of relationality with other people, nature, society, and political systems as constitutive of wellbeing.

### **2.1.3 The non-universality of wellbeing dimensions**

The above considerations on the material, subjective, and relational dimensions of wellbeing are underlined by the idea that human beings live in specific cultures and societies (Boarini et al., 2014), with values and goals located in broader normative frameworks and ideologies, understandings of the sacred, what the moral order is and should be, and what it means to live a meaningful life (White, 2010; Mathews, 2012). Thus, understandings of wellbeing should go beyond universal terms to account for the framework of each culture (Diener and Tov, 2007). People's lived experiences and evaluations of their lives are inextricably and intricately bound to their social, economic, political, cultural, and natural circumstances. In the context of research in developing countries, the need to identify relevant and valued aspects of wellbeing has been highlighted by Camfield et al. (2009). They suggest that research should identify aspects of people's lives that are important and valued but rarely measured.

McGregor (2007) critiques assessments of wellbeing that focus on pre-established criteria regarding what people should have and do rather than on 'what people think and feel about what they should have and do'. These wellbeing assessments rely on identifying wellbeing criteria in a 'top-down' manner, meaning that the criteria are identified from a particular philosophical position, conceptual framework, or ideology (McGregor et al., 2015). The idea of creating a universal list of wellbeing criteria led researchers to often favour 'top-down' approaches, with most multidimensional wellbeing frameworks often being developed from a particular theoretical position (McGregor et al., 2015). Others, however, have advocated for the idea of identifying the wellbeing criteria in a 'bottom-up' manner, through engagement with the people whose wellbeing is of interest. The identification of locally relevant wellbeing criteria for the purpose of policy development is important, as Melamed (2011) says, because it has the ability to bring together the views and priorities of the poor and socially marginalised people and those responsible for policymaking. However, despite the popularity of the idea that people should participate in their own development (Chambers, 1997; Narayan, 2000), participatory processes are rarely

incorporated into policy drafting and implementation (Catley et al., 2008; McGregor et al., 2015).

The 'Voices of the Poor' study conducted by the World Bank is a successful example of integration between 'top-down' and 'bottom-up' approaches to identifying wellbeing indicators in a way that are both theoretically valid and locally relevant. Narayan et al. (2000) identified valued aspects of wellbeing that people used in forming assessments of their lives and concluded that they viewed and experienced wellbeing as multidimensional. Furthermore, the identified valued aspects were similar to many wellbeing criteria arising from social psychology (Cummins, 1998). This study recognises the need to assess people's wellbeing in a way that is locally relevant as well as theoretically valid.

## **2.2 Perceptions of fairness**

### **2.2.1 Conceptualising fairness at the intersection of social, environmental and climate justice**

Adaptation in the context of climate change invokes questions of fairness because it affects where people 'live, work and play' (Agyeman et al., 2016; Adger et al., 2006; Novotny, 2000). Drawing on Adger et al. (2016), this study conceptualises fairness as an element of social, environmental, and climate justice. As with all such divisions within an interdisciplinary and interconnected paradigm, here, the concepts of social, environmental, and climate justice overlap (Schlosberg, 2013; Taylor, 2000; Walker, 2012).

Social justice refers to relations between the individual and society and is concerned with ensuring that individuals receive what is their due from society. It focuses on process, voice, and outcome beyond legal justice (Banai et al., 2011; Clark, 2015; Dobson, 1998; O'Neill, 2011). Environmental justice is one form of social justice that focuses on underlying drivers of vulnerability, exposure to environmental risks, decision-making processes, and representation of people and nature (Schlosberg, 2013; Walker, 2011). Research within this area has expanded from its original focus on the unequal distribution of environmental risks to cover an extensive array of issues, geographies, and spatial scales (Schlosberg, 2013; Walker and Burningham, 2011). Recent environmental justice work focuses on decision-making, identity, and power relations (Martin et al., 2014; Schlosberg, 2007; Walker, 2012).

In time, the scope of environmental justice expanded to encompass the effects of climate change (Chakraborty et al., 2016). Environmental justice scholars and advocates have begun to frame climate change as another environmental condition that demonstrates the broader social injustice of poor and minority communities (Schlosberg and Collins, 2014), with climate justice stemming from the conceptualization of environmental justice discourse (Agyeman et al., 2007; Schlosberg and Collins, 2014). The unjust impacts of climate change – not only



the inequity of impact but also other forms of injustice, such as lack of recognition and inclusion in political decision-making – represent another example, or symptom, of social injustice (Schlosberg and Collins, 2014). Drawing on conceptualisations from the fields of social, environmental, and climate justice, fairness in the context of this study is seen as the social acceptability of unequal processes and outcomes (Adger et al., 2016; Forsyth, 2014). These considerations on processes and outcomes constitute the two main justice dimensions: distributive and procedural. This study focuses on justice, particularly on perceptions of fairness as a social phenomenon.

### **2.2.2 Distinguishing between justice, fairness, and perceptions of fairness**

While justice and fairness are sometimes used interchangeably, the two terms have distinct meanings. ‘Justice’ refers to a standard of rightness and ‘fairness’ refers to the ability to make judgements in reference to one’s interests or feelings (Velasquez et al., 2014). Justice is interested in identifying the nature of ‘the just’ rather than identifying criteria for assessing how just society is (Biondo, 2012; Sen, 2009). Fairness is context-bound and is interested in developing procedures that ensure the concerned parties receive their ‘fair share’ of benefits and burdens (distributive justice) and adhere to a system of ‘fair play’ (procedural justice) (Burgess, 2020; Velasquez et al., 2014). Fairness needs not only to be done but to be seen to be done (Adger et al., 2016). Hence, a key issue in climate change adaptation is how individuals perceive fairness (Hamilton, 2018).

Studies on fairness in climate change adaptation have expanded their scope beyond the traditional focus on international issues to account for fairness at local levels (Adger et al., 2006). Issues of fairness are more evident and severe at local levels (Paavola and Adger, 2002). The literature on local acceptance shows the causal relationship between fair consideration of local interests and outcome acceptance (Liu et al., 2020). This highlights the importance of fairness to socially marginalised and vulnerable communities (Adger, 2016; Paavola and Adger, 2006a, 2006b). Therefore, a greater understanding of perceptions of fairness of

socially marginalised and vulnerable communities exposed to environmental change is critical in promoting fair adaptation interventions (Hamilton, 2018). However, to date, little work has examined people's perceptions of fairness with regards to environmental adaptation policies, instead tending to focus on conservation or environmental management interventions (Ikeme, 2003; Sikor, 2013). Empirical studies on local perceptions of fairness can illuminate key concerns and trade-offs, but such work in non-Western contexts remains rare (Friedman et al., 2018; Lehmann et al., 2018).

Perceptions of fairness can be assessed against universal criteria or context-bound criteria (Burgess, 2020). Research on perceptions of fairness is often based on universal criteria (typically equality and proportionality of benefits and burdens) (Lau et al., 2021a). However, the use of these universal fairness criteria may not reflect the criteria that matter to individuals and communities as they experience climate change and adaptation interventions. The way fairness is perceived is by nature subjective (Gross, 2007) and plural (Sen, 2009), therefore, varying across issues and communities (Lecuyer et al., 2018; Paavola, 2003). This requires recognition that the formation of perceptions of fairness is socially determined and contextually bound (Walker, 2014; Agyeman et al., 2009). To investigate perceptions of fairness, an understanding of what people value, need, and prioritise is necessary (Forsyth, 2014). This can inform the development and implementation of fair adaptation interventions (Holland, 2017; Curry et al., 2015; Galliard, 2010).

### **2.2.3 Dimensions of justice: distributive, procedural, and recognition**

Distributive justice is concerned with the fair and equitable distribution of benefits and burdens at individual and societal levels (Walker, 2012). It also addresses the mitigation and compensation for adverse impacts and the empowerment of disadvantaged or vulnerable social groups (Saunders, 2020; Zafra-Calvo et al., 2019). It denotes how the resulting benefits and burdens (including material and non-material, objective and subjective) of a decision are distributed (Walker,

2014). The distribution of benefits and burdens can be seen in terms of who ‘wins’ and who ‘loses’ from adaptation interventions (Adger et al., 2011; Lau et al., 2021a; O’Brien and Leichenko, 2003).

Early environmental justice work focused on the inequitable distribution of environmental risks and government protection (Mohai et al., 2009), with environmental conditions seen as an indicator of social and economic inequality (Agyeman et al., 2016; Schlosberg and Collins, 2014). More recent work addresses the complexity of distributive justice, expanding the criteria beyond equality and equity (Walker, 2012). Loomis and Ditton (1993) highlight the importance of perceptions of distributive fairness in the allocation of fishery quotas when resources are scarce. They show, however, that there is little guidance on how ‘fair’ outcomes can be qualified and quantified.

Procedural justice denotes how processes of decision-making and implementation are managed, who is involved in such processes and how they govern distribution (Lau et al., 2021a; Lind and Tyler, 1988). Procedural fairness is important because it affects legitimacy, which is the extent to which governmental decisions are acceptable to participants and non-participants in the decision-making process that are affected by such decisions (Adger et al., 2005a). Several criteria that promote perceptions of procedural fairness and legitimacy in climate change adaptation have been empirically identified.

Outcomes and decision-making processes are interrelated (Adger et al., 2016; Lind and Tyler, 1988; Wayessa, 2010) and important to the perceived fairness of climate change adaptation (Adger et al., 2005a). The interrelatedness of perceptions of fairness in outcomes and processes is also important, as it has been shown that perceptions of distributive fairness affect perceptions of procedural fairness and vice versa, resulting in perceived overall fairness (Wayessa, 2010). Outcomes are important for instrumental reasons, as adaptation has the potential to reduce the exposure to environmental risks and people’s vulnerability; decision-making processes are important as they lead to acceptance, legitimacy, and successful implementation of policies (Adger et al., 2005a; Aitken, 2010; Gross, 2007).

Recognition justice refers to acknowledging and respecting cultural diversity, including issues regarding whose views, identities, interests, knowledge, and worldviews are respected and valued in climate change adaptation discourse and practice (Lau et al., 2021a; Martin et al., 2016). This form of justice is based on the understanding that environmental management should recognise the importance of cultural diversity, misrecognition, and misrepresentation (Schlosberg, 2007, 2012; Walker, 2012). Theorisations of justice in climate change adaptation have mostly focused on distributive and procedural aspects, often neglecting issues of recognition (Miller, 2020).

The environmental justice literature provides insights into how recognition of injustice is constructed examining how the exclusion of certain groups of people from decision-making processes enables inequitable distribution (Ikeme, 2003). On the other hand, the inclusion of certain groups of people in the decision-making process can lead to perceived legitimacy and acceptance of adaptation policies, regardless of the lack of beneficial personal outcomes. For example, Gross-Camp (2017) shows that in Tanzania, conservation projects that include the local communities in the decision-making process result in support for forestry management, even without notable material benefits.

Whilst some frame recognition as a dimension of justice at the same conceptual level as distributive and procedural justice (Sikor et al., 2014), others argue that recognition is a prerequisite for the other two dimensions (Schlosberg, 2007; Lau et al., 2021a; Lecuyer et al., 2018). Figure 2.1 depicts the interconnectedness of distributive and procedural justice within the context of recognition justice. In this sense, it shows whose values matter in the evaluation of the fair distribution of benefits and burdens and whose views count in the decision-making process (Lecuyer et al., 2018; Lau et al., 2021a; Martin et al., 2013). In other words, recognition justice is not concerned with what is fair or unfair but allows for diverse conceptions of fairness among individuals (Martin et al., 2013). This study recognises the interrelatedness of distributive and procedural justice and considers recognition justice as the broader justice context in which different conceptualisations of fairness can exist.

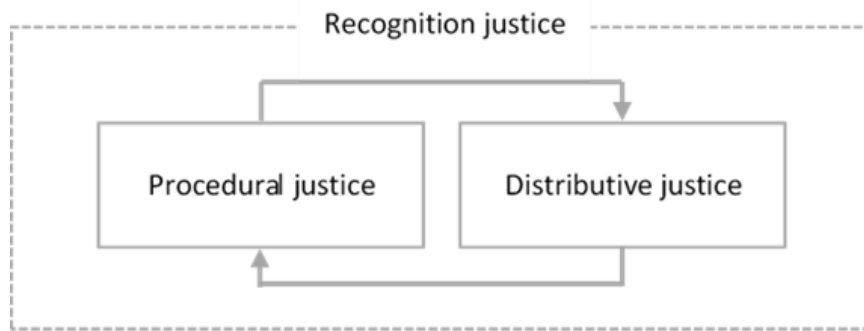


Figure 2.1. A representation of dimensions of justice.

## 2.2.4 Perceptions of distributive fairness

Distributive justice is concerned with how the resulting benefits and burdens of an adaptation intervention are distributed between and within groups (Walker, 2014). What constitutes a fair distribution is, however, a matter of much debate. There are various distributive justice criteria: such as equity, equality, and need (Adger et al., 2016; Lau et al., 2021b).

Equity denotes that the higher individual contribution to the common goal, the greater the individual benefit should be and vice versa, such that individual outputs and inputs are balanced (Bennett et al., 2019; Lecuyer et al., 2018; Martin et al., 2014). In reference to climate change adaptation, for example, this principle can refer to adaptation support that is given in proportion to an individual's loss and damage caused by climate change. Equality refers to the equal treatment of all people, disregarding their differences, such that a uniform distribution of benefits and burdens is achieved (Bennett et al., 2019; Lecuyer et al., 2018; Martin et al., 2014). In the context of climate change adaptation, for example, this principle can refer to equal opportunities to adaptation or equal outcomes of adaptation interventions amongst individuals. Need denotes that a higher contribution should be given to the people most dependent on the resource in question, or a smaller contribution should be offered to those with more resources (Bennett et al., 2019; Lecuyer et al., 2018; Martin et al., 2014). As far as climate change adaptation is concerned, this principle can infer that those most in need

(in terms of their exposure to environmental risks and high levels of vulnerability) should be given more support or priority when adaptation support is given.

Which of these principles constitutes distributive justice is likely to differ according to the situation (what is being distributed among whom) and who is assessing the fairness of the distributive matters in question (Sen, 2009). For example, Fabinyi et al. (2013) find that fishermen in Papua New Guinea and the Philippines apply the criterion of equality when assessing the costs and benefits related to fishery management. Dietz and Atkinson (2005) find that perceptions of distributive fairness are informed by equity considerations of environmental and economic aspects, with respondents making trade-offs between the two aspects when assessing policies.

Research on perceptions of distributive fairness finds that people often hold pluralistic views, simultaneously employing multiple allocation principles (Adger et al., 2016; Lau et al., 2021a). Scott et al. (2001) find that respondents use both equality and need principles and made trade-offs in perceptions of income distribution. Similarly, Lecuyer et al. (2018) find that perceptions of distributive fairness in environmental management are informed by equality, equity, and need considerations, with equity being the most commonly applied criterion and need being the most relevant criterion for poor respondents.

### **2.2.5 Perceptions of procedural fairness**

Procedural justice is concerned with how processes of decision-making and implementation are managed, who is involved in such processes, and how they govern distribution (Gross, 2007; Lau et al., 2021a; Martin et al., 2015; Thomas and Twyman, 2005). Perceptions of procedural justice are important as they affect legitimacy (Adger et al., 2005a; Levi et al., 2009; Tyler, 2006). The conceptual development of procedural justice is neither fixed nor universal but dynamic and contextually bound. There are no universal rules for decision-making processes that guarantee legitimacy and perceived fairness because

cultural expectations and interpretations define what is or not legitimate and fair (Brown et al., 2002). Individuals apply procedural fairness criteria selectively, following different rules at different times, and therefore a nuanced understanding of procedural justice is needed (Ruano-Chamorro et al., 2021). Empirical studies investigating procedural fairness, acceptance, and perceived legitimacy of environmental decision-making identify a number of conditions under which stakeholders perceive decision-making processes to be fair, whereas others do not (e.g. Adger et al., 2016; Adger and Nelson, 2010; Berardo, 2013; Hamilton, 2018; Saglie et al., 2020; Smith and McDonough, 2001; Thomas and Twyman, 2005).

Transparency in decision-making processes consists of clearly communicating the necessary information to the relevant stakeholders in a timely manner (Colquitt et al., 2001; Maguire and Lind, 2003; Reed, 2008; Rove and Frewer, 2000; Schreckenbergh et al., 2016). Participation in decision-making processes is considered essential for achieving successful adaptation (Ruano-Chamorro et al., 2021). First, the participation of those most affected by decision-making processes is a fundamental human right (Aarhus Convention, 1998; Rio Declaration, 1992). Second, it allows for a wider range of views, including local and diverse knowledge, as well as issues of personal value to inform decision-making (Pascual et al., 2014). Participatory processes lead to perceived legitimacy, thereby fostering support and compliance with adaptation policies (de Vente et al., 2016; Epstein, 2017; Reed, 2008), empowering previously excluded social groups, and building trust (Brown et al., 2002). Representation of different social groups with different views and interests affects perceptions of procedural fairness (Leventhal, 1980; Maguire and Lind, 2003; Smith and McDonough, 2001). However, vulnerable and marginalised communities are often deterred from political participation (Cole and Foster, 2001).

Voice, consideration, and process control are three criteria that shape the role of participants in decision-making processes (Leventhal, 1980; Thibaut and Walker, 1975). Voice refers to the ability of participants to express their views, needs, priorities, and preferences (Maguire and Lind, 2003; Ruano-Chamorro et al.,

2021). Consideration refers to the ability of participants to have their voices taken into consideration in decision-making processes (Smith and McDonough, 2001). For example, in the context of climate change adaptation, this entails that policymakers consider the views of women or the traditional knowledge of Indigenous communities in their decision-making processes.

Process control refers to the ability to directly influence the decision-making process. Participants in consultation meetings are found to form perceptions of fairness in relation to process control if they feel that their opinions and preferences influence the final decision. Research also shows that, sometimes, if participants have a voice in the decision-making process, even in the absence of process control, they perceive the process as fair (Maguire and Lind, 2003). When participants feel they are able to express their views, needs, and priorities and that decision-makers have seriously considered these, they are found to perceive the decision-making process as fair even if the final outcome does not align with their preferences (Smith and McDonough, 2001; Tyler, 2015). Other criteria such as consistency, bias suppression, neutrality, accountability, correctability, ethicality, trustworthiness, and respect are also found in empirical studies, but they are less common (Leventhal, 1980; Lind and Tyler, 1988; Tyler, 2015; Tyler and Blader, 2003).

Which of these criteria constitutes procedural justice is likely to differ according to the situation, with individuals often using multiple criteria in assessing the fairness of decision-making processes. Smith and McDonough (2001) investigate perceptions of fairness towards a public participation process and find that citizens assess the fairness of the process based on representation, voice, consideration, logic, and desired outcomes. Similarly, Maguire and Lind (2003) emphasise the importance of fair procedure in environmental policymaking and highlight the importance of representation, information availability, voice, process, and overall satisfaction with procedures and outcomes.



## 2.2.6 How expectations of government affect perceptions of fairness

Expectations are people's complex beliefs about the future and can be influenced by a vast number of concerns. People's expectations of government can be sophisticated or naïve, optimistic or pessimistic, and influenced by historical considerations. For example, whether people had previous positive or negative experiences with the government affects their expectations of future government action (Miller and Listhaug, 1999; Sloane, 1991). Where people live also affects expectations. For example, people in developed nations have different expectations of their government than those in developing countries (Manning, 2001).

In the context of climate change adaptation, beliefs about the government's intent and capacity can influence expectations. Chamlee-Wright and Storr (2010) offer a categorisation of expectations informed by the interaction between optimistic or pessimistic views of government intent and capacity (Table 2.1).

<b>A typology of expectations of government action and inaction</b>		
	<b>Pessimistic capacity</b>	<b>Optimistic capacity</b>
<b>Pessimistic intent</b>	The government is incapable of helping and has no intention of doing so.	The government is able to help but has no intention of doing so.
<b>Optimistic intent</b>	The government wants to help but is unable to do so.	The government wants to help and is capable of doing so.

Table 2.1. A typology of expectations of government action and inaction. Source: Chamlee-Wright and Storr (2010)

Optimistic intent and capacity refer to an individual's belief that the government has the intent and capacity to provide climate change adaptation support. Pessimistic intent and capacity refer to the reverse circumstances, namely, an individual's belief that the government has no intent or capacity to provide climate change adaptation support. Beliefs about optimistic or pessimistic expectations of intent and capacity can come together in diverse ways. For example, a person who observes the government investing significant resources in climate change

adaptation but does not see a corresponding decrease in environmental risks, might conclude that, despite the government's best efforts and intentions, it is incapable of effective climate change adaptation. A person who instead observes the government announcing its intention to adapt vulnerable communities to climate change but does not take concrete steps to do so, might remain optimistic about the government's capacity but become pessimistic about its intent. This affects people's expectations in the sense that they expect the government to do what it says it will do if the government is able to make a credible commitment (Chamlee-Wright and Storr, 2010).

These optimistic and pessimistic expectations form regardless of whether an individual's beliefs about government intent and capacity are accurate or inaccurate, informed or uninformed, realistic or not. Furthermore, expectations of government are not necessarily consistent with an individual's policy preference. A displaced individual may think that the government should relocate households to safer locations but expect little or no aid. Perceptions of fairness are, therefore, not only formed by an individual's beliefs of fairness in decision-making processes and outcomes but also by their expectation of government intent and capacity.

### **2.2.7 Why perceptions of fairness matter: acceptance, legitimacy, and subjective wellbeing**

Planned relocation in the context of climate change is likely to significantly increase in the future (Ferris, 2015). Fairness in this context matters because it has the capacity to affect the acceptance of outcomes and the legitimacy of state-society relations (Adger et al., 2016). These ethical and practical issues lead to calls for a deeper understanding of perceptions of fairness in climate change policy (Klinsky et al., 2016). Assessments of distributive fairness often demonstrate that adaptation interventions reinforce existing inequalities and do little to alleviate underlying vulnerabilities (Adger et al., 2005a; Thomas and Twyman, 2005). Gross (2007) argues that when policy outcomes are perceived

to be unfair, especially when perceived as disproportionately benefiting certain groups of society at the perceived expense of others, it can lead to divided communities, damaged social relations, and a decrease in social wellbeing.

Bennett and Dearden (2014) and Fabinyi et al. (2013) show that sometimes people care more about unjust processes than whether a resource is sustainably managed. This demonstrates how failing to account for fairness in decision-making processes can undermine policies. Perceived procedural fairness is a key factor in the overall effectiveness of environmental governance as it leads to a perceived legitimacy of the decision, higher acceptance of the outcome, and support of and trust in decision-makers (Berardo, 2013; MacCoun, 2005; Siddiki and Goel, 2017; Syme and Nancarrow, 2012). A lack of perceived procedural fairness is associated with anti-environmental behaviour (Raycraft, 2020) and dissatisfaction with participatory processes (Booth and Halseth, 2011).

The literature on planned relocation also focuses on the importance of participatory processes. In a 2019 study in Fiji, Piggott-McKellar et al. found that participatory decision-making was of utmost importance to the relocated community. The importance of such participatory processes in planned relocation is outlined by researchers (Correa et al., 2011; de Sherbinin et al., 2011a; Ferris, 2015; Kingston and Marino, 2010; McAdam and Ferris, 2015; McNamara and des Combes, 2015) and established international guidelines (UNHCR, 2015).

From an ethical perspective, perceptions of fairness underpin people's ideas of flourishing or suffering (Lau et al., 2021a). Perceptions of procedural justice can influence subjective wellbeing (Lind and Tyler, 1988; Narayan, 2000; Sayer, 2011; Tyler, 2015). On the one hand, fair policies tend to instil a sense of wellbeing and satisfaction among affected individuals; on the other hand, policies that are perceived as unfair can lead to negative repercussions on wellbeing, overall dissatisfaction, and lack of acceptance and compliance with policies (Maiese and Burgess, 2020). Research on the relationship between perceptions of policies and subjective wellbeing is limited in the literature. Sun and Xiao (2012) show that perceptions of fairness in income distribution and social security policies positively correlate with subjective wellbeing. Alesina et al. (2004) find

that when inequality is high, individuals report lower happiness levels. The relationship between perceptions of fairness and wellbeing is relevant for two reasons: first, the aim of social and environmental policies should not be limited to material goals but should include non-material goals, such as happiness and life satisfaction (Veenhoven, 2002); and second, subjective wellbeing is a valuable outcome measure for assessing whether societal conditions meet people's needs (Noll, 2002).

## **2.3 Planned relocation**

### **2.3.1 Planned relocation in the context of climate change**

Increasing impacts of anthropogenic climate change – such as higher average temperatures, increased risk of drought, sea-level rise, changes in precipitation patterns, and more frequent and intense weather events – affect ecosystem services, natural resources, and the habitability of certain areas (IPCC, 2014, 2022). Among the impacts of these climatic effects on human societies, changes in human mobility patterns are of particular relevance (Black et al., 2013a; Hugo, 1996; MacKellar et al., 1998; Myers, 2002). The IPCC noted the link between global environmental change and human mobility from as early as 1990, highlighting that human migration might be the greatest single impact of climate change.

The debate on the environmental change and human mobility nexus shifted, however, from advocating the idea that there are a growing number of 'environmental refugees' (Myers, 2005), towards an increasingly shared recognition of the multicausal nature of migration that includes complex social, political, demographic, and economic drivers (Black et al., 2011; Hugo, 2010; Stojanov et al., 2014). For example, Tacoli's (2011) work on migration in Bolivia, Senegal and Tanzania presents evidence that processes of desertification, soil degradation, and disrupted rainfall patterns are not the direct drivers of migration, but rather their impacts on livelihoods influence migration patterns. It is also

important to note that environmentally induced mobility has been occurring throughout history (Nunn, 2007; Oppenheimer, 2003; Turney and Brown, 2007) and has played an important role in the survival of populations and their livelihood resilience (Barnett and McMichael, 2018; Castles, 2008; Sheller and Urry, 2006). Environmental change, however, can affect migration drivers, ultimately changing and exacerbating migration patterns (Black et al., 2013a).

Human mobility in the form of migration, displacement, and immobility is taking place around the world where populations with different adaptive capacities are exposed to environmental risks (Black et al., 2013a; Connel and Coelho, 2018; Richards and Bradshaw, 2017; Tacoli, 2009, 2011). Here, people are defined not only in terms of their potential status as victims in need of protection but also in terms of their individual adaptive capacity. This expansion of thinking brought reflections on 'limits to adaptation', 'climate resilience', 'social transformations', and 'individual decision-making' (e.g. Adger et al., 2009; Folke et al., 2002). In this context, on the one hand, human mobility is seen either as a form of climate change adaptation (Nicholls et al., 2011; Warner et al., 2010) or as a consequence of a failure to adapt in-situ (Tacoli, 2009). On the other hand, climate change is seen as an obstruction to adaptive human mobility for populations with limited resources to move (Ferris and Weerasinghe, 2020; Warner et al., 2013). While considerable research exists on both migration and displacement in the context of environmental change, much less is known about immobility and how planned relocation can be used to effectively adapt immobile communities to the effects of climate change (Barnett and Webber, 2009; Ferris, 2015; Piguet et al., 2011).

It seems likely that the poorest, most marginalised people will become immobile populations; those who have the means to move will do so, whilst those who do not have the means to move from areas that are no longer habitable because of the effects of climate change will need to be relocated by their governments (Adger et al., 2012; Bogardi and Warner, 2008; Ferris, 2015). These are highly vulnerable populations that are exposed to environmental risks and have limited adaptive capacity (Fraser et al., 2003; Ikeme, 2003; Kelly and Adger, 2000;

Leichenko and O'Brien, 2002). These populations are sometimes described as trapped (Cundill et al., 2021). In this context, planned relocation is seen as a measure of last resort to adapting individuals to the effects of climate change (Hino et al., 2017).

Planned relocations have already been enforced in some parts of the world, such as Fiji (Barnett and McMichael, 2018; Martin et al., 2018; Piggott-McKellar et al., 2019), Alaska (Bronen, 2008, 2010), Mozambique (Arnall, 2013a), Papua New Guinea (Connell, 2016; Lipset, 2013), Solomon Islands (Albert, 2018), Vietnam (Chun, 2014; de Sherbinin et al., 2011b), and India (Danda et al., 2019; Mortreux et al., 2018; Stefancu, 2022). In recent years, planned relocation has become the preferred approach to post-disaster adaptation in developing countries (Badri et al., 2006). Of particular concern is however the possibility that governments can use the narrative of climate change-induced risks as a justification for planned relocation that is instead pursued for political or economic gain (Arnall, 2014; Barnett and O'Neill, 2012; Kothari, 2014).

### **2.3.2 Planned relocation: a sign of adaptation or loss and damage?**

Planned relocation is explored in two main bodies of work, with some researchers on the one hand arguing that planned relocation can be an effective adaptation intervention in the context of climate change whereas others on the other hand claiming that the movement away from one's homeland constitutes loss and damage in the context of climate change (McNamara et al., 2018).

Over the last decade, the literature on human mobility and environmental change focused on the complexity of relationships between human mobility and climate change (Bardsley and Hugo, 2010; Black et al., 2013a), governance challenges (Warner, 2010), and views of affected populations (Farbotko and Lazrus, 2012). According to a vast number of researchers, human mobility in response to the impacts of climate change should be considered a form of adaptation (Bardsley and Hugo, 2010; Black et al., 2011; Castles, 2002; McLeman and Smit, 2006).

Similarly, the Intergovernmental Panel on Climate Change (2007) defines adaptation as anticipatory or reactive human responses to climatic stimuli or their effects to moderate harm or take advantage of beneficial opportunities. Policymakers also frame planned relocation as a “*positive adaptation response*” instead of a “*failure to adapt*” to the effects of climate change (Baldwin, 2013, p. 1475). For example, human mobility in response to climate change is described as a positive livelihood diversification strategy and a transformational opportunity for resilience (Foresight, 2011). Planned relocation, specifically, is promoted as a measure of last resort when adaptation in-situ fails (Hino et al., 2017) with the potential to lead to societal transformations (Siders et al., 2021). Nevertheless, most empirical work on planned relocation challenges its potential for successful adaptation (Barnett and Webber, 2009; de Haas, 2005).

In recent years, arguments on whether human mobility can be considered a positive adaptation strategy in the context of climate change emerged. Specifically, some argue that planned relocation burdens people with the need to move instead of adapting them in-situ and can thus be seen as an adaptation failure (Heine and Petersen, 2008; Raleigh and Jordan, 2010). This leads to interpretations of planned relocation in response to climate change in terms of a negative impact of climate change that ultimately causes loss and damage (Bettini, 2013; Felli, 2013; Gesing et al., 2014; Methmann and Oels, 2015). There is no universally agreed definition of loss and damage. Warner et al. describe the concept as “... *negative effects of climate variability and climate change that people have not been able to cope with or adapt to*” (2013, p. 20). This implies that loss and damage do not occur if adaptation is possible.

Policymakers are now discussing the loss and damage concept within the United Nations Framework Convention on Climate Change (UNFCCC) negotiations. Whilst the UNFCCC has indicated an interest in including loss and damage within the adaptation framework, proponents of the concept have argued that loss and damage goes beyond adaptation (Calliari, 2014). At the international level, discussions on planned relocation are now informed by loss and damage considerations. At the recent 2015 Conference of the Parties meeting in Paris,

the executive committee of the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts were requested to establish a task force to “*develop recommendations for integrated approaches to avert, minimize and address displacement related to the adverse impacts of climate change*” (UNFCCC, 2015, p. 8). The Warsaw International Mechanism established Loss and Damage as a ‘third pillar’ of climate policy, alongside mitigation and adaptation (Roberts and Pelling, 2018). However, the debate surrounding Loss and Damage remains vague, particularly with reference to adaptation policy and practice (Mechler et al., 2020).

The primary theoretical approach to loss and damage is framed in terms of compensation (Farber, 2008; Page and Heyward, 2017; Vanderheiden, 2011; Vulturius and Davis, 2016). Some, drawing on the concept of climate justice, argue that the poorest and most marginalised communities are expected to experience the worse climate change impacts even though they contributed very little to climate change and, therefore, they should be duly compensated (McNamara, 2014). However, whilst compensation has particular appeal to address losses of economic goods with instrumental value, it struggles with addressing non-economic losses such as ecosystem services and cultural identity. The issue of compensation, whilst it prioritises what is quantifiable and of interest to governments, it obfuscates non-quantifiable aspects of harm that are important to people within their own contexts, ultimately constituting an injustice (McShane, 2017).

Scholarly and policy interest in non-economic losses associated with climate change impacts has grown over the past five years (Barnett et al., 2016; Roberts and Pelling, 2018; Tschakert et al., 2017, 2019). Loss, as Barnett et al. (2016) explain, “*arises when people are dispossessed of things that they value, and for which there are no commensurable substitutes*” (p. 977). In this context, the concept of loss builds on the scholarship on personal and collective notions of identity and culture (Morrissey and Oliver-Smith, 2013), and the symbolic, emotional, and cultural impacts that are most valued by people within the contexts of their lives (Adger et al., 2011). This can be investigated through subjective



understandings of wellbeing (McShane, 2017), specifically focusing on people's first-voice narratives of loss through which values, needs, feelings, and perceptions can be assessed (Preston, 2017).

Despite this distinction between planned relocation as a potential adaptation strategy or a representation of the failure to adapt, McNamara et al. (2018) argue that planned relocation in the context of climate change can be adaptation and loss and damage at the same time. They argue that loss and damage is a negative repercussion of climate change and is experienced by everyone who is forced to leave their habitual places of residence, whether they are relocated or not. Their research shows that in Alaska, communities have chosen to relocate due to their exposure to environmental risks and lack of ability to adapt in-situ, despite their reluctance to relocate due to anticipated loss and damage. However, the choice to relocate does not negate the loss and damage that is occurring due to environmental risks, and that will occur due to the planned relocation. This study focuses primarily on planned relocation as a form of climate change adaptation, but considerations on whether it also leads to loss and damage are discussed.

### **2.3.3 Planned Relocation: a conceptual framework**

Planned relocation is: *“a planned process in which persons or groups of persons are assisted to move away from their homes or places of temporary residence, are settled in a new location and provided with the conditions for rebuilding their lives”* (UNHCR, 2015, p.5). This definition originates from the Cancun Adaptation Framework, which was adopted by parties at the Cancun Agreements at the 2010 Conference of Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC). The study adopts the definition of planned relocation as proposed by the UNHCR.

The body of work on planned relocation in the context of climate change is interchangeably using an array of terms – planned relocation (Gromilova, 2014;

McMichael, 2019; UNHCR, 2015), community relocation (Campbell, 2010; McNamara and des Combes, 2015), forced relocation (Maldonado et al., 2013), climate-induced relocation (Bronen, 2015a, 2015b; McNamara et al., 2018), managed retreat (Danda et al., 2019; Agyeman et al., 2009), resettlement (Arnall, 2013a, 2019b), climate-induced resettlement (de Sherbinin et al., 2011a) – with distinctions often seeming purely semantic (McAdam and Ferris, 2015). Throughout this study, the term ‘planned relocation’ is used consistently. Two conceptual issues are addressed to clarify how the concept of planned relocation is framed for the purpose of this study.

First, a distinction is often made between planned relocation as the process of physically moving people and resettlement as the process of assisting people in the new location to reconstruct homes, re-establish livelihoods, and ensure access to services (Campbell 2010; Ferris, 2015; McAdam and Ferris 2015). There is extensive evidence of governments physically relocating people without providing support for their resettlement. For example, in Somalia, the government moved people from camps for internally displaced persons to the fringes of urban areas without providing any form of support in the new location (Yarnell, 2014). For the purpose of this study, planned relocation and resettlement are not seen as two separate processes but the term planned relocation encompasses both aspects. This is clearly expressed in the definition, which refers to both ‘assistance to move away’ and ‘conditions for rebuilding lives’.

A second distinction can be made between planned relocation as the process of permanently moving people away from areas at risk and evacuations as the process of temporarily moving people away from areas at risk in the aftermath of rapid-onset disasters (Ferris, 2015). Some evacuees may, however, never return home, as for example after Hurricane Katrina in New Orleans (Groen and Polivka, 2010) or the 2011 tsunami and nuclear disaster in Japan (Kaufmann and Penciakova, 2011). On the other hand, those relocated do not always choose to remain in the new location, as for example people in rural Mozambique had chosen to return to their original communities when the flooding subsided (Arnall et al., 2013a). For the purpose of this study, planned relocation is considered a

permanent strategy consisting of moving people away from areas at risk and supporting them with building their lives in the new locations, with the stated aim of adapting them to the impacts of climate change.

### **2.3.4 Understanding the impacts of planned relocation**

To date, a small body of research focuses on realised planned relocation as a response to climate change (Arnall, 2013a, 2019b; Bronen, 2015b; Bronen and Chapin, 2013; Kothari, 2014; Maldonado et al., 2013; Marino, 2012; McMichael, 2019; Mortreux et al., 2018; Piggott-McKeller et al., 2019). However, over the past 20 years, more than 300 million people have been relocated due to infrastructure, development, urbanisation, and conservation projects (Cernea and Schmidt-Soltau, 2006; Chen et al., 2017; Manatunge et al., 2009). Planned relocation driven by development activities such as dam construction and mining activities, known as Development-Induced Displacement and Resettlement (DIDR), is the most studied in terms of design and outcomes. The extensive DIDR literature shows that involuntary planned relocation often leads to the impoverishment of those who are induced to move (Satiroglu and Choi, 2015). The most influential work is Cernea's (1997) Livelihoods Risks and Reconstruction model, which identifies key risks and impoverishment processes during DIDR, including landlessness, joblessness, homelessness, marginalisation, food insecurity, loss of access to common property resources, increased morbidity, and community disarticulation. This model is applied extensively in empirical research, which leads to a considerable body of work framing planned relocation as a poverty-causing intervention (Cernea, 2008).

Restoration of livelihoods is seen as a key factor in determining whether a planned relocation initiative is successful (Arnall et al., 2013a; Ngenyam Bang and Few, 2012). Furthermore, involuntariness to move is exacerbated in communities whose livelihoods are tied to place (Adger et al., 2011; Agyeman et al., 2009; Igor, 2005). Communities in Iran and Peru were reluctant to relocate when the restoration of livelihoods was seen as uncertain in the new place (Badri

et al., 2006; Oliver-Smith, 2009). Studies in rural Mozambique show that the ability to secure a viable livelihood is a key determinant of whether relocated individuals remain in their new locations or return to the river valleys despite the risks posed by floods (Arnall et al., 2013a). The issue of livelihoods appears to be particularly important for communities that rely on traditional forms of subsistence agriculture. Mathur (2008) shows how in a major planned relocation programme conducted by Coal India Limited subsistence farmers struggled to adopt new livelihood options despite the company offering them work opportunities. The transition from a subsistence lifestyle to urban life sometimes leads to the migration of people in search of work, causing greater social disarticulation (Tong et al., 2017).

The issue of agricultural land availability post-planned relocation is, therefore, of particular importance for the livelihoods of those relying on subsistence agriculture. Landlessness – seen as a lack of access or entitlement to land (Sati and Vangchhia, 2017) – occurs in the aftermath of a planned relocation. This is due to a lack of direct compensation with land (Sati and Vangchhia, 2017) or, as seen in Nepal, due to having to sell the land given as compensation to mitigate for the hardships faced after the planned relocation (Lai Ming and Saumik, 2013). Predominantly, a decrease in land size (Hang Bui and Schreinemachers, 2011) as well as land quality (Piggott-McKellar et al., 2020) is reported by relocated communities; this leads to reductions in crop production and diversity of food sources, ultimately affecting food insecurity (Delang and Toro, 2011). Current examples of planned relocation exist predominantly in rural communities with a heavy reliance on subsistence lifestyles, which means that land considerations are of paramount importance.

Planned relocation also affects the social fabric of places, with issues arising from the integration of relocated communities into host communities. For example, ethnic tensions between Indigenous and non-Indigenous people arose in Chile (Gonzalez and Simon, 2008). Only few studies find positive interactions between new village members and the maintenance of social ties despite communities being dispersed (Sisinggih et al., 2013; Rodgers and Wang, 2006).

Improvements in the aftermath of planned relocation are found in relation to housing due to improvements in size and safety (Wang and Wall, 2007), and access to services and public infrastructure (Mteki et al., 2017). However, access to facilities and services, such as electricity, incurs a financial cost that relocated communities in Mozambique could not afford (Arnall et al., 2013a). Similarly, the cost of a more urbanised lifestyle, including transport to school, work, or the market, left communities in Inner Mongolia unable to access these new opportunities (Dickinson and Webber, 2007).

### **2.3.5 Planned relocation as climate change adaptation**

There is growing interest in academic and policy arenas to frame planned relocation as a climate change adaptation strategy (Bogardi and Warner, 2008). In this setting, human mobility is recognised as a form of adaptation to climate change, and States are encouraged to undertake *“measures to enhance understanding, coordination and cooperation with regard to climate change induced migration, displacement and planned relocation where appropriate, at the national, regional and international levels”* (UNFCCC, 2010, p.5). Some argue that planned relocation can potentially bring development opportunities to people (Arnall, 2019b). However, recent studies from the environmental risk literature indicate that planned relocation as a disaster risk reduction strategy can negatively affect sustainable livelihoods formation in relocated communities (Badri et al., 2006; De Silva and Yamao, 2007). The academic and grey literature on planned relocation in the context of climate change highlights aspects that should be taken into account when enforcing planned relocation as an adaptation strategy. Arnall (2019b) proposes three key principles to this effect.

First, planned relocation as adaptation should only be undertaken as a measure of last resort (Hino et al., 2017). Such intervention should occur when populations are exposed to severe environmental risks that affect the habitability of an area and when other in-situ interventions have failed (Arnall, 2019b). Framing planned relocation only as a measure of last resort could overcome the danger of people

being relocated for political or economic gain under the pretence of climate change adaptation (Barnett and Webber, 2009).

Second, planned relocation as adaptation should be voluntary in nature. A distinction can be made between voluntary planned relocation, where the individuals are willingly choosing whether they want to stay behind or move (Schmidt-Soltau and Brockington, 2007), and involuntary planned relocation, where the individuals are forced to move by the party enforcing the planned relocation (Wood, 2014). However, in the context of climate change, this distinction is not a true dichotomy (Warner et al., 2013; Wilmsen and Wang, 2014). 'Voluntary' planned relocation does not mean that individuals have the ability to decide in complete freedom, but rather, that voluntariness to move exists when other adaptation options still exist. 'Involuntary' planned relocation occurs when other adaptation options are no longer available. Planned relocation, however, should be enforced only with the free and informed consent of concerned individuals (McAdam and Ferris, 2015).

For free and informed consent to occur, a participatory process needs to be in place to enable all socioeconomic groups to take part in decision-making processes (McAdam and Ferris, 2015; Weerasinghe, 2014). The importance of such participatory processes is highlighted by researchers (Correa et al., 2011; de Sherbinin et al., 2011a; Ferris, 2015; Kingston and Marino, 2010; McAdam and Ferris, 2015; McNamara and des Combes, 2015) and established international guidelines (UNHCR, 2015). Participatory processes allow participants to express their priorities which, when taken into account, have led to the ability to meet their needs and expectations (Maldonado et al., 2013; McNamara et al. 2018). The Guiding Principles on Internal Displacement suggest that the involvement of the target population in the decision-making and implementation processes of planned relocation allows individuals to make some voluntary decisions even when the planned relocation is the only viable adaptation option (UNHCR, 2015). Barnett and O'Neill (2012) have shown that availability of information, participatory decision-making processes, and an

overall sense of process control led individuals to perceive planned relocation as successful.

Third, planned relocation as adaptation should be developmental in nature. This means that the planned relocation should be used as an opportunity to reduce both exposure to environmental risks and vulnerabilities (de Sherbinin et al., 2011a). This means that, at an absolute minimum, relocated individuals should not experience negative wellbeing repercussions as a result of the planned relocation. Instead, the long-term wellbeing of those relocated should improve. Participatory processes in planned relocation have the potential to lead to outcomes that not only rebuild but also improve livelihoods (Kingston and Marino 2010). Furthermore, Piggott-McKellar et al. (2020) suggest that post-planned relocation livelihoods, vulnerabilities, and wellbeing impact people's perceptions of whether the planned relocation was voluntary or forced. This demonstrates the interrelatedness of issues regarding voluntariness, consent, participation, and outcomes in planned relocation.

These three key principles for planned relocation as climate change adaptation bring together considerations from the literature on human mobility and environmental change that frame planned relocation as a 'positive adaptation response' as well as considerations on procedural fairness and distributive fairness, with a specific focus on outcomes in terms of wellbeing. These principles, therefore, bring together the key variables of this thesis.

### **2.3.6 Trapped populations?**

Involuntary immobility and the inability to escape environmentally dangerous locations are notions that often appear in the literature on environmental migration (Carling, 2002; Lubkemann, 2008). 'Trapped populations' refers to people who are unable to move from environmentally high-risk areas, with such immobility exacerbating their vulnerability (Black and Collyer, 2014; Cundill et al., 2021; Milan and Ruano, 2014). In this sense, the notion is used to identify people

geographically 'trapped' in environmentally high-risk areas due to a lack of adaptive capacity (Ayeb-Karlsson et al., 2018, 2020; Black et al., 2013b). To be considered trapped, individuals must not only lack the ability to move but also either need or want to move (Black and Collyer, 2014). Thus, a consideration of trapped populations must distinguish between ability, need and desire to move. It raises the theoretical problem of differentiating between involuntary and voluntary mobility, meaning between people who wish to move and need to do so because of environmental risks but remain in situ and people who do not wish to move despite being faced with environmental risks and degradation (Adams, 2016).

The underlying discourse around the complex and multifaceted nature of immobility has profound influences on the way in which policy and practice approach the needs of populations exposed to environmental risks (Ayeb-Karlsson et al., 2018). When immobility is voluntary, government intervention can represent an imposition. Studies in the Pacific islands highlight local resistance to planned relocation (Farbotko and Lazrus, 2012; McNamara and Gibson, 2009), with evidence from Tuvalu showing that some people report preferring to drown rather than move (Farbotko et al., 2016). When immobility is involuntary and people self-identify as 'trapped', governments should act (Adger et al., 2011; Hess et al., 2008; Stefancu, 2022). However, the decision on whether to adapt communities to climate change is often an ad hoc response ranging from planned relocation (full-scale movement of communities) to no intervention (Mortreux et al., 2018). In Alaska, for example, indigenous communities are calling for climate change adaptation in the form of planned relocation (Bronen, 2013; Bronen and Chapin, 2013; Maldonado et al., 2013), yet the government has not committed to pursuing such intervention (Albert et al., 2018).



## **2.4 The study's contribution to knowledge**

This chapter presents the literature on climate change adaptation and highlights the pressing need for researchers and policymakers to advance the understanding of fair adaptation interventions that can improve wellbeing outcomes for vulnerable and marginalised groups. Specifically, the impacts of planned relocation, which is often promoted as a climate change adaptation measure of last resort, need to be understood (McAdam and Ferris, 2015; Hino et al., 2017). Despite the recognised need to assess adaptation interventions in comparative ways, most research focuses on planned relocation or immobile populations in isolation (Mortreux et al., 2018). To address these research gaps, this study proposes a novel combination of wellbeing and justice theory to compare the impacts of government action and inaction in response to environmental risks. This elicits new insights into the complex outcomes of climate change adaptation in different circumstances, namely Planned Relocation, Adaptation In-Situ, and Lack of Adaptation. Uneven adaptation intervention outcomes are assessed through comprehensive conceptualisations and the integration of multidimensional wellbeing and perceptions of distributive and procedural fairness (Figure 2.2). In doing so, the analysis makes contributions to the fields of environmental justice and climate change adaptation.

The assessment of wellbeing accounts for the multidimensional and interconnected nature of the concept. Whilst the traditional approach in investigating wellbeing in planned relocation has been predominantly from the point of view of material circumstances, most notably livelihoods (Arnall et al., 2013a; Agyeman et al., 2009; Badri et al., 2006; Oliver-Smith, 2009; Piggott-McKellar et al., 2020), this study accounts for material, subjective, and relational circumstances. The concept of wellbeing is here seen as dynamic, with people's evaluations of wellbeing located in specific social, cultural, political, and economic contexts. The ability to achieve wellbeing is recognised to be bound to place, both in terms of environmental quality and cultural significance (Altman and Low, 1992; Rollero and DePiccoli, 2010). Research shows that environmental change, as well as adaptation interventions, can have adverse impacts on human wellbeing.

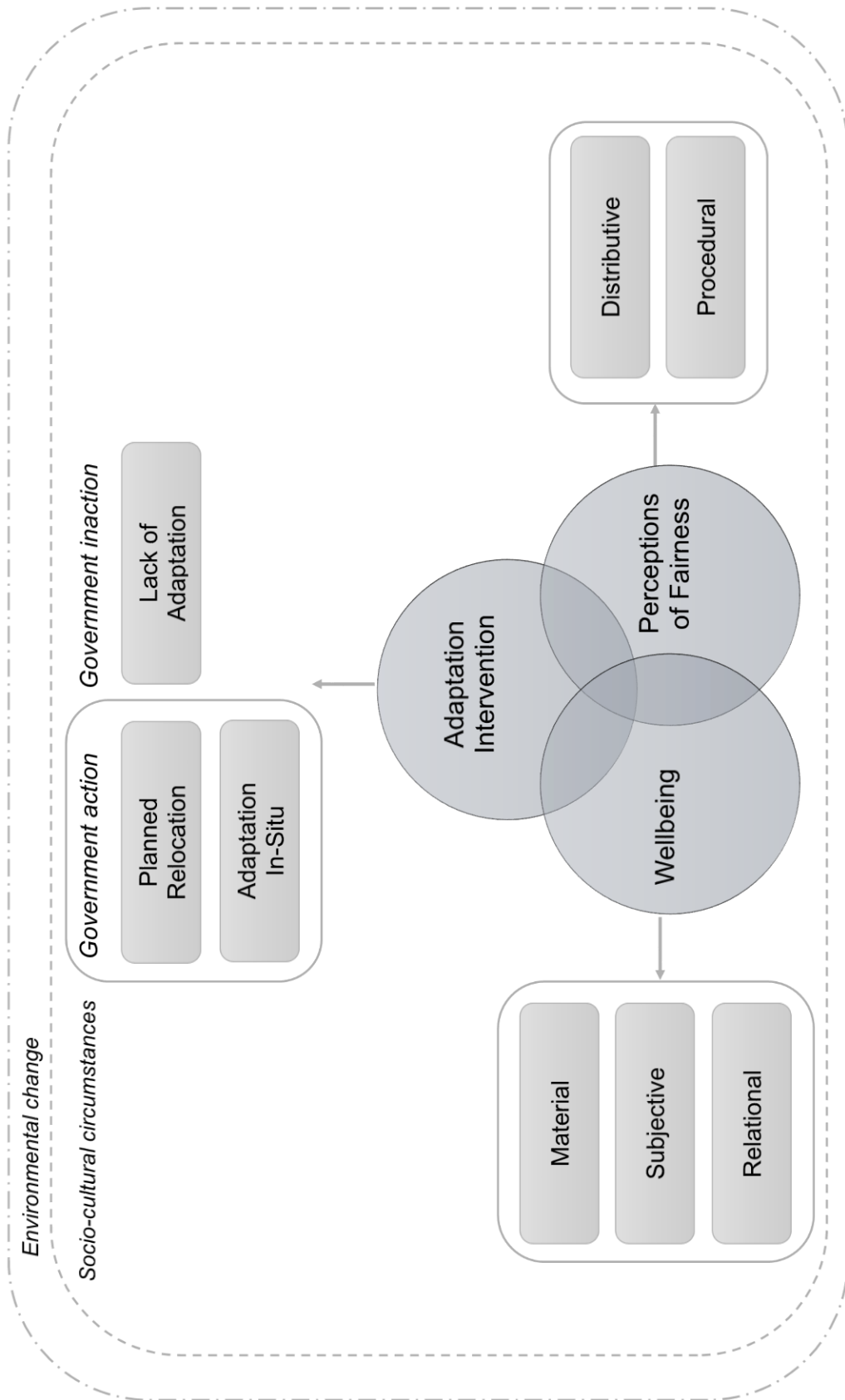


Figure 2.1. The theoretical and conceptual framework of the study

This study aims to expand this understanding by presenting a comprehensive analysis of multidimensional wellbeing in populations exposed to environmental risks and subject to uneven adaptation interventions. A comparative assessment of wellbeing within-population over time (before and after the planned relocation, adaptation in-situ, or lack of adaptation) and between populations is sought.

Perceptions of fairness affect the acceptance of outcomes (distributive justice) and the legitimacy of decision-making processes (procedural justice) (Adger et al., 2016; Gross, 2007; Lecuyer et al., 2018; Saglie et al., 2020; Smith and McDonough, 2001; Thomas and Twyman, 2005). Considering this evidence, some have called for further research on perceptions of fairness in local climate change policy (Klinsky et al., 2016; Schlosberg et al., 2017). This study aims to expand the understanding of fairness at local levels by investigating perceptions of distributive and procedural fairness in government action and inaction in the context of climate change adaptation. These novel insights shed light on how socially marginalised groups form perceptions of fairness.

Lastly, this study aims to bring these two areas of research together by assessing whether perceptions of fairness affect subjective wellbeing. Research on the relationship between perceptions of policies and subjective wellbeing shows that policies that are perceived as unfair can lead to negative repercussions on wellbeing, overall dissatisfaction, and lack of acceptance and compliance with policies (Maiese and Burgess, 2020; Narayan, 2000; Tyler, 2015; Sayer, 2011). This is of particular importance as the premise of this study is to expand the understanding of how climate change adaptation interventions, particularly planned relocation, can be fair and developmental. The study, therefore, provides evidence on whether perceptions of fairness in socially marginalised and unevenly adapted populations affect their subjective wellbeing and the role that expectations of government play.

In order to address these identified knowledge gaps, this study aims to answer the following research questions:

## **1. How is the wellbeing of populations exposed to environmental risks affected by government action and inaction?**

1.1 What aspects of wellbeing are valued by the three unevenly adapted sub-populations?

1.2 How is government action and inaction affecting the material, subjective, and relational wellbeing of the three unevenly adapted sub-populations?

1.3 How does wellbeing compare among the three unevenly adapted sub-populations?

## **2. How is government action and inaction perceived by unevenly adapted sub-populations in terms of fairness?**

2.1 What aspects of fairness are valued by the three unevenly adapted sub-populations?

2.2 How is government action and inaction affecting the perceptions of distributive and procedural fairness of the three unevenly adapted sub-populations?

2.3 How do perceptions of fairness compare among the three unevenly adapted sub-populations?

## **3. Do perceptions of fairness influence the wellbeing of unevenly adapted sub-populations?**

## **Chapter 3. Methodology**

This chapter begins by providing an overview of the comparative cross-sectional research design and the mixed methods approach chosen for the empirical application of this study. The choice of the research design and approach is justified through existing theoretical and empirical knowledge on investigating wellbeing and fairness. The case for first identifying the wellbeing and fairness criteria through a combination of inductive and deductive approaches and then applying these theoretically valid and locally relevant criteria in the central empirical investigation is put forward. The data collection and data analysis methods are explained in relation to the research questions they correspond to, and ethical considerations are highlighted.

The chapter also describes the empirical context of the research. It explains the importance of understanding the impacts of government action and inaction in deltaic environments, specifically in the Ganges-Brahmaputra Delta (India). The chosen field sites are described using secondary data and key informant interviews.

### **3.1 Research design and approach**

#### **3.1.1 Cross-sectional research design**

This study employs a comparative cross-sectional research design to provide an overview of the similarities and differences within and between unevenly adapted sub-populations, namely Relocated, Adapted In-Situ, and Non-Adapted. For research question 1.2, *'How is government action and inaction affecting the material, subjective, and relational wellbeing of the three unevenly adapted sub-populations?'*, the study employs a time-series cross-sectional design to compare the wellbeing of unevenly adapted sub-populations in time as follows:

- for the Relocated sub-population, a comparison between a year before the Planned Relocation and the present time;
- for the Adapted In-situ sub-population, a comparison between a year before the Adaptation In-Situ (the construction of the embankment) and the present time;
- for the Non-Adapted sub-population, a comparison between ten years ago (when environmental risks had not reached the threshold of making human habitation and economic livelihoods potentially unviable) and the present time.

A longitudinal study would have involved the measurement of wellbeing variables in the sampled sub-populations at different points in time to document the effect of their exposure to different causal factors, in this case, the different forms of government action and inaction. However, considering that the three sub-populations have been subject to government action and inaction at different points in time prior to the start of this study, a longitudinal design was not possible. Instead, the time-series cross-sectional design interrogates respondents on a series of wellbeing variables at past and present points in time, as described above, relying on recollection. As far as the rest of the research questions are concerned, the study employs a comparative cross-sectional design to compare the wellbeing, perceptions of fairness, and the relationships between these concepts among the three unevenly adapted sub-populations in the present time.

The choice of this research design is supported by the design's theoretical suitability to the proposed study. The comparative cross-sectional research design is flexible enough to allow for comparisons between sub-populations and the use of quantitative and qualitative data (Bryman, 2006; Cummings, 2017; Gray, 2017). The choice of this research design is also supported by its use in other similar empirical studies. A literature review identified studies that employ a cross-sectional design in the investigation of relationships between wellbeing and disaster preparedness (Gowan et al., 2014; Qing et al., 2021), wellbeing and sense of community in the aftermath of disasters (Bourke et al., 2022; Ke, 2010), wellbeing and climate change adaptation policies (Hiscock et al., 2017), planned

relocation and environmental justice (Ajibade, 2019), and perceptions of fairness and responses to environmental hazards (Adger et al., 2016), among others.

### **3.1.2 A mixed-methods approach**

In this study mixed methods are used for the purpose of development (using results from one data collection method to help develop another data collection method) and expansion (seeking to expand the breadth and range of the investigation by using different methods for different enquiry components) (Bryman, 2006; Greene, 2007; Schoonenboom and Johnson, 2017). The mixed methods approach is compatible with the time-series and comparative cross-sectional research design (Allen, 2017; Bryman, 2006; Cummings, 2017). The quantitative element is used to make statistical inferences about the wellbeing and perceptions of fairness of each of the three sub-populations of interest across time and between the three sub-populations at the present time. The qualitative element is first used to identify locally valued aspects of wellbeing and fairness and second to provide depth of understanding and to put the statistical inferences in context (Cummings, 2017).

The choice of a mixed methods approach for both the purpose of development and expansion is supported by its common use in investigating wellbeing and perceptions of fairness. Camfield et al. (2009) employ qualitative methods to identify locally relevant aspects of wellbeing and use these findings in the development of sensitive and relevant quantitative measures. Similarly, Smith and McDonough (2001) employ qualitative data to understand the criteria participants use to judge the fairness of procedures and outcomes in policymaking. Gasper (2010) and McGregor et al. (2015b) combine data from quantitative and qualitative approaches to enhance the explanatory power of their studies on wellbeing. Similarly, Bennett and Dearden (2014) and Silva and Mosimane (2012) employ quantitative and qualitative methods to investigate perceptions of fairness towards policies. Furthermore, a growing number of national and international agencies highlight the importance of assessing public

policy in terms of its impact on human wellbeing, accounting for both objective and subjective dimensions of wellbeing using quantitative and qualitative methods (OECD, 2011; ONS, 2011). The use of the mixed methods approach in similar empirical investigations and its importance in policy impact assessments validates its choice for this study.

### **3.1.3 The epistemology underpinning data collection and analysis**

The study takes a constructivist epistemological position, which frames wellbeing and perceptions of fairness as social constructions. This means that the meanings of 'wellbeing' and 'fairness' do not exist in some external world but are created by the subject's interactions with the world (Gray, 2017). The meaning of these concepts is therefore constructed, not discovered. Hence, multiple, contradictory, but equally valid accounts of wellbeing and fairness can co-exist. The social construction of meaning provides the basis for people to know what they value, assess how satisfied they are with their lives, and form fairness judgements (Syme et al., 2000; White and McGregor, 2006).

From this perspective, wellbeing is not seen as a universal concept but as *"socially and psychologically co-constituted in specific social and cultural contexts"* (Deneulin and McGregor, 2010, p. 1). Similarly, fairness is not seen as a predetermined list of conditions under which some actors perceive decision-making processes and outcomes to be fair, whereas others do not (Berardo, 2013). The conceptual developments of both 'wellbeing' and 'fairness' are, in fact, neither fixed nor universal, with individuals applying criteria selectively and forming their assessments of wellbeing and fairness differently in diverse situations and cultures (Deneulin and McGregor, 2010; Hamilton, 2018).



### **3.1.4 Combining deductive and inductive approaches**

This thesis employs a combination of deductive and inductive approaches to identify theoretically valid and locally relevant wellbeing and fairness criteria. A deductive analysis is initially employed to identify criteria from a particular philosophical position, conceptual framework, or ideology (Biedenweg et al., 2016; Breslow et al., 2016, 2017). The resulting list of wellbeing and perceptions of fairness criteria creates a partially predetermined structure to the investigation. Deductive approaches are often used in quantitative social sciences as they focus on external validity, allowing for generalisation of research findings to different contexts and populations (Polit and Beck, 2010). However, whilst this approach promotes external validity due to its theoretical foundation, it may overlook the perspectives of those who are the subjects of the investigation (Reyes, 2004; Woodhouse et al., 2015).

On the other hand, the inductive approach allows for criteria to be identified through engagement with the study subjects. This approach relies on qualitative methods and emphasises the need for contextual understanding and ecological validity (Beauchamp et al., 2018; Loveridge et al., 2020; Woodhouse and McGabe, 2018). Ecological validity in wellbeing studies focuses on the inclusion of areas of people's lives that are important but potentially rarely measured to reflect the lived experience of those who are studied (Camfield et al., 2009; Loveridge et al., 2020). Narrative interviews (n=14) were conducted with Relocated, Adapted In-Situ, and Non-Adapted respondents to explore the complex contextual nuances of what aspects of wellbeing and fairness are valued and why (see Chapter 4 section 4.1 'Valued aspects of wellbeing' and Chapter 5 section 5.1 'Valued aspects of fairness'). This approach is popular in studies on wellbeing and fairness. Rather than applying a pre-existing list of criteria, the use of participatory methods sheds light on what people consider to be living a good life (Camfield et al., 2009; Gasper, 2010; McGregor et al., 2015a; Robeyns, 2005) and how people assess fairness in processes and outcomes (Adger et al., 2016; Lecuyer et al., 2018; Smith and McDonough, 2001).

Integrating deductive and inductive approaches allows for the reconciliation of universalist frameworks that propose what wellbeing consists of and locally-valued aspects of wellbeing (Boarini et al., 2014; Loveridge et al., 2020; McGregor, 2018). Therefore, the operationalisation of 'wellbeing' and 'fairness' is here developed through a combination and deductive and inductive processes. There are many similarities when comparing the lists of criteria identified deductively and inductively. Many of the valued aspects identified inductively are well-established and used in other empirical research. Wellbeing and perceptions of fairness criteria with both external and ecological validity are therefore selected and used for the development of the survey questionnaire and semi-structured interviews.

### **3.2.5 Empirical research structure**

The empirical research is structured in three phases, with each focusing on a set of research questions and relevant quantitative and qualitative data collection and analysis methods (Table 3.1). Phase I of the empirical research does not aim to answer a specific research question but to provide an in-depth understanding of the study sites and the people living there. This background research is conducted through secondary data and key informant interviews (n=8). Secondary data consists of regional and local documents on climate change adaptation policies and development initiatives, as well as previous empirical studies conducted in Sagar Island. Key informant interviews (n=8) were conducted with key members of the Relocated, Adapted In-Situ, and Non-Adapted sub-populations, researchers, and policymakers. The output of phase I consists of familiarisation with the study sites, profiling of the three sub-populations, and developing relationships of trust and mutual understanding with these sub-populations.

Phase	Research question	Data collection method	Data analysis method	Data aim
<b>Phase I</b>	N/A	Secondary data Key informant interviews	Thematic content analysis	Familiarisation with study sites Development of relationships with the local communities
<b>Phase II</b>	RQ 1.1 What aspects of wellbeing are valued by the three unevenly adapted sub-populations? RQ 2.1 What aspects of fairness are valued by the three unevenly adapted sub-populations?	Literature review Narrative interviews	Thematic content analysis	Identifying aspects of wellbeing (RQ 1.1) and fairness (RQ 2.1) that are theoretically valid and locally valued
<b>Phase III</b>	RQ 1.2 How is government action and inaction affecting the material, subjective, and relational wellbeing of the three unevenly adapted sub-populations? RQ 2.2 How is government action and inaction affecting the perceptions of distributive and procedural fairness of the three unevenly adapted sub-populations? RQ 1.3 How does wellbeing compare among the three differently adapted sub-populations? RQ 2.3 How do perceptions of fairness compare among differently adapted sub-populations?	Surveys Semi-structured interviews	Descriptive statistics Wilcoxon signed-rank test or Sign test Thematic content analysis	Investigating past and present material, subjective and relational wellbeing in each sub-population: Relocated, Adapted In-Situ, and Non-Adapted
	RQ 2.2 How is government action and inaction affecting the perceptions of distributive and procedural fairness of the three unevenly adapted sub-populations? RQ 1.3 How does wellbeing compare among the three differently adapted sub-populations? RQ 2.3 How do perceptions of fairness compare among differently adapted sub-populations?	Surveys Semi-structured interviews	Descriptive statistics Thematic content analysis	Investigating perceptions of procedural and distributive fairness in each sub-population: Relocated, Adapted In-Situ, and Non-Adapted
	RQ 1.3 How does wellbeing compare among the three differently adapted sub-populations? RQ 2.3 How do perceptions of fairness compare among differently adapted sub-populations?	Surveys Semi-structured interviews	Descriptive statistics Kruskal-Wallis H test Thematic content analysis	Comparing present material, subjective and relational wellbeing (RQ 1.3) and perceptions of distributive and procedural fairness (RQ 2.3) between the three sub-populations: Relocated, Adapted In-Situ, and Non-Adapted
	RQ 3. Do perceptions of fairness influence the wellbeing of the unevenly adapted populations?	Surveys Semi-structured interviews	Spearman's nonparametric (rank-based) correlation	Investigating how perceptions of procedural and distributive justice influence subjective wellbeing

3.1. The structure of the empirical research in three phases.

Phase II of the empirical research aims to answer research questions 1.1 '*What aspects of wellbeing are valued by the three unevenly adapted sub-populations?*' and 2.1 '*What aspects of fairness are valued by the three unevenly adapted sub-populations?*'. This phase consists of exploratory work, with the aim to provide the inductive component for the identification of theoretically valid and locally relevant wellbeing and fairness criteria. Narrative interviews (n=14) were conducted with Relocated, Adapted In-Situ, and Non-Adapted respondents to shed light on valued aspects of wellbeing and fairness. These aspects are then operationalised in measurable variables and used to develop the survey (n=222) and semi-structured interviews (n=14) for phase III.

Phase III of the empirical research aims to answer the remaining research questions. A combination of quantitative and qualitative data was collected to investigate: (i) changes in wellbeing across time to assess the impact of government action and inaction, (ii) perceptions of fairness towards government action and inaction, and (iii) associations between perceptions of fairness and subjective wellbeing. Surveys (n=222) and additional semi-structured interviews (n=14) were conducted equally across the three sub-populations.

### **3.2.6 Ethical considerations**

Permission was acquired from the Indian government to conduct this study. The research design and methods were subject to the standard ethical review procedures employed by the University of Exeter. Clear protocols to uphold the core ethical principles were devised and implemented. Prior to any form of data collection, a local research assistant provided the participant with an Information Sheet and explained the purpose of the study, the participant's role in it, and matters such as confidentiality and anonymity. Participants were then asked to sign an Informed Consent Form stating that they agreed to participate to the study and that they understood the information provided.

The data collection methods were developed with the support of research assistants who understood Sagar Island's social and cultural context. The data collection methods were developed in English and then translated into Bangla, the spoken language of the study participants. Particular attention was paid to ensure the translation maintained the correct meaning of key terms and questions. The research assistants spoke the local language, had experience collecting quantitative and qualitative data, and had a good understanding of the case of Sagar Island. Guidance documents and training sessions were provided by the principal investigator to ensure the research assistants were well prepared to undertake the data collection.

To promote participation of women and marginalised individuals, participants were interviewed by a same-gender research assistant and interviews were conducted with either male or female participants at one time. Interviews with multiple participants occurred only with members of the same household. Interviews were recorded, transcribed verbatim, and translated into English by the research assistants. Survey responses were logged onto Survey Solutions, the World Bank's data collection software. All data were anonymous, confidential, password-protected, and stored securely on the University of Exeter's server. Participants are referred to in the empirical chapters of this thesis and across other outputs from this thesis using pseudonyms.

## **3.2 Empirical application**

### **3.2.1 Ganges-Brahmaputra Delta: its importance and relevance for this study**

Data were collected in the Ganges-Brahmaputra Delta, India. Low-lying coastal zones in dynamic environments, such as deltas, are particularly interesting areas of study as the biophysical and socio-economic challenges people face are exacerbated by climate change impacts (Dastagir, 2015; Rahman et al., 2020). Deltaic environments are, in fact, considered climate change hotspots worldwide

(Deltares, 2008; De Souza et al., 2015; IPCC, 2014). To date, government-led climate-induced planned relocation has already occurred in deltas across South Asia, in places such as India (Adger and Safra de Campos, 2020; Danda et al., 2019; Das and Hazra, 2020; Mortreux et al., 2018; Rahman et al., 2020), Bangladesh (Adger and Safra de Campos, 2020; Conway et al., 2019; Safra de Campos et al., 2020; Islam et al., 2010; Khan, 2021; Naser, 2019), and Vietnam (Chun, 2014; Lindegaard, 2020; Miller, 2020; Miller and Dun, 2019).

The Ganges-Brahmaputra Delta is a socio-ecological system highly exposed to climate hazards, including coastal flooding, tropical cyclones, and storm surges, causing high rates of coastal erosion and salinity intrusion; yet, it is also a place where there is a high population density exposed to these environmental risks (Ghosh, et al., 2014; Giosan et al., 2014; Renaud et al., 2013; Tessler et al., 2015). The biophysical and socio-economic challenges that people face in the delta are increasing alongside the changing climate and anthropogenic developments (Dastagir, 2015; Rahman et al., 2020). Climate change is expected to increase the frequency and magnitude of both slow- and rapid-onset disasters in India (Brown et al., 2018; Nicholls et al., 2018). In 2019, the monsoon season in India saw the highest amount of rainfall in over 25 years and the latest withdrawal of the monsoon in India's recorded history (India Meteorological Department, 2020). This led to severe monsoon floods and mudslides, causing hundreds of thousands of people to flee their homes. The monsoon was followed in November 2019 by cyclone Bulbul, which struck the coasts of India and Bangladesh, causing storm surges, heavy rains, and flash floods. In the region of West Bengal, approximately 3.5 million people were directly affected by cyclone Bulbul, with over 500,000 homes and 1.5 million hectares of crops damaged or destroyed (IDMC, 2021).

These climatic disasters have brought about impacts associated with land tenure, decreased agricultural production, and livelihood displacement resulting in income loss, food insecurity, rural unemployment, and forced migration (Amoako-Johnson et al., 2016; Hossain et al., 2013; Nandi et al., 2016). The impacts of these climatic events are particularly severe for inhabitants of the Ganges-

Brahmaputra Delta in the Indian state of West Bengal. These challenges are causing an increasing number of migrants to be leaving the delta for predominantly economic reasons (Adger et al., 2018; Safra de Campos et al., 2020; Hajra and Ghosh, 2018), with others remaining in place as they do not have the means to adapt nor migrate (Mortreux et al., 2018). For those unable to respond, the government acted in uneven ways (Mortreux et al., 2018).

In these circumstances, planned relocation is a relevant and important climate change adaptation intervention (Adger et al., 2018). In India, land acquisition and planned relocation are highly sensitive politically, with a long history of violent planned relocation processes linked to development projects (Bala, 2006; Ren, 2017). The exposure to environmental risks, combined with high levels of vulnerability and a history of diverse forms of government action and inaction in the context of adaptation, made the Ganges-Brahmaputra Delta (India) an important and relevant location for this study.

### **3.2.2 The political and institutional context of planned relocation in West Bengal**

Planned relocation first took place in India after the Independence in 1947, when the country was building its path to development through predominantly the construction of large multipurpose river valley projects, thermal power, mining, and infrastructure development (Sampling et al., 2015). Displacement and planned relocation in India are caused primarily by development projects, political conflicts, the instauration of Protected Area Networks and Conservation areas, and slow- and rapid-onset natural disasters (Sampling et al., 2015). The Internal Displacement Monitoring Centre estimates the number of displaced people at around 60 million due to development projects and at least 3,428,000 due to natural disasters (IDMC, 2021). The Working Group on Human Rights in India claims that India has the highest number of people displaced due to development projects in the world (WGHR, 2012). However, most planned relocation programmes do not follow a clear plan (Asif, 2000; Negi and Ganguly, 2011).

Studies reveal that often the human and environmental costs of projects are not investigated thoroughly. Consequently, a number of issues arise, such as a lack of livelihoods rehabilitation for those relying on natural resources and agricultural practices, non-participatory decision-making processes which lead to involuntary relocations, a lack of compensation for Tribal communities that are not able to produce legal documents proving the ownership of their land, and a patriarchal definition of family which leads to a lack of compensation for women-headed households (Garikipati, 2002; Modi, 2004).

In response to this situation and pressure from national and international actors, the Government of India started drafting the National Policy on Resettlement and Rehabilitation in 1985, which after multiple revisions, came into force in 2004, to then be revised again in 2007 (Fernandes, 2008). The Policy, however, is not applicable to projects that involve the relocation of less than a specified number of households (400 in the plain areas and 200 in the Tribal or hill areas), and it overlooks the implications that the acquisition of common property has on those which rely on it for their livelihoods, which could lead to the indirect displacement of people (Sampling et al., 2015). These Policy shortcomings were attempted to be rectified with the passing of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation, and Resettlement Act in 2013. The most significant change introduced by this new Act was the requirement of a Social Impact Assessment, which the Act recommends to be conducted in consultation with the Panchayat. However, this clause does not necessarily offer a platform for those directly affected to have a voice in the decision-making process. This is due to the regional governmental structure of West Bengal, where the Panchayat is the traditional village council, with the Pradhan being the village-level leader of the Panchayat. The Pradhan is the point of contact between State government officials and the village community. Specifically, the Act states that Social Impact assessments should be conducted with the Panchayat, with no provisions requiring the involvement of the directly affected communities. Furthermore, there are no specific provisions for planned relocation in the context of environmental disasters or degradation.



The National Disaster Management Act of 2005 makes it mandatory for every Ministry or Department of the Government of India, at the National and State level, to prepare a Disaster Management Plan with explicit provisions on emergency relief operations, rehabilitation, and reconstruction after natural disasters (Sampling et al., 2015). Specifically, West Bengal's Regional Disaster Management Plan specifies that planned relocation should be enforced on a 'need-based consideration' and not in response to specific factors. This leaves room for the regional government to decide on a case-by-case basis whether to relocate the local communities of the Ganges-Brahmaputra Delta exposed to environmental risks and degradation. In this context, government inaction can be justified.

The District Disaster Management Plan, on the other hand, focuses primarily on relief in the immediate aftermath of natural disasters. Planned relocation is mentioned in the Plan as a temporary option during the repair or reconstruction of houses damaged by disasters or as a permanent option when human habitation is no longer viable at the site of interest. The only guidance on permanent planned relocation is that "*the relocation site should be in close proximity to the existing sources of livelihood*", but no provisions are set for those whose livelihoods are linked to the sites deemed no longer viable (West Bengal Disaster Management and Civil Defence Department, 2020). Furthermore, similarly to the Regional District Management Plan, there are no conditions under which planned relocation must be enforced, leading to decisions regarding government action and inaction to be taken on a case-by-case basis.

### **3.2.3 Sagar Island: an introduction to the fieldsite**

This study examines government action and inaction in Sagar Island. The island is located in the Southwest of the Ganges-Brahmaputra Delta in West Bengal, India (Image 3.1B). Sagar Island, alongside the neighbouring islands of Lohachara Island and Ghoramara Island, are increasingly exposed to sea level rise, coastal flooding, storm surges, and cyclones, leading to high rates of coastal

erosion and salinity intrusion (Ghosh et al., 2014). These circumstances led to the submergence of Lohachara Island in 1991, the loss of over 70% of Ghoramara Island since the 1950s, and a 2.8% rate of land loss in Sagar Island over the 2001-2008 period (Ghosh et al., 2014; Hazra and Samanta, 2016). According to the 2011 Census, Sagar Island has an area of 282 km<sup>2</sup> with a population of 212,037. The population comprises 109,468 males and 102,668 females, most identifying as Hindu (87.88%), followed by Muslim (11.73%). Ghoramara Island has a population of 5,193, comprised of 2,644 males and 2,549 females (Census of India, 2011a).

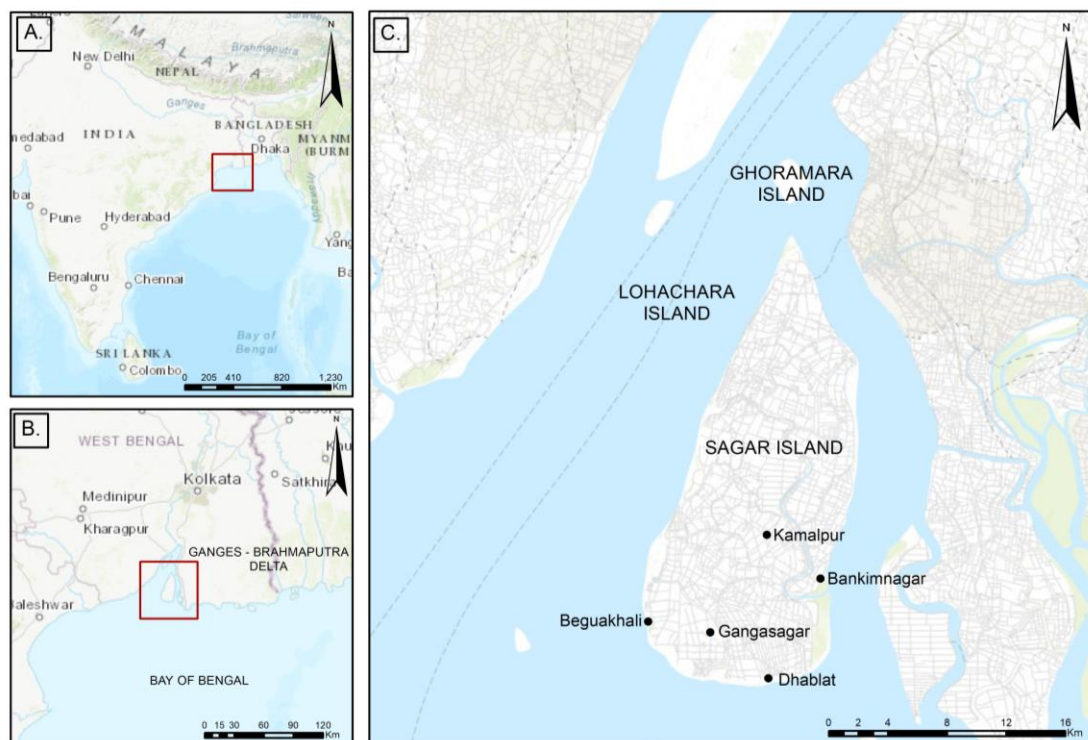


Image 3.1. Map of India and the Bay of Bengal (A); map of the Bay of Bengal and the Ganges-Brahmaputra Delta (B); and map of Sagar Island (C)

People living here are not only exposed to environmental risks but also have limited adaptive capacity. The Human Development Measures across the region remain low, with 34% of the population below the poverty line, 59% living without access to clean drinking water, and 47% living with some food shortage (Centre for Sciences and Environment, 2016). These vulnerable individuals have a limited capacity to adapt to and cope with environmental risks (Das and Hazra, 2020) and, therefore, require government adaptation interventions.

Government action to adapt populations to environmental risks has been uneven. The government has intervened by relocating those displaced or exposed to coastal erosion from Lohachara Island and Ghoramara Island to Sagar Island, specifically to the villages of Kamalpur, Bankimnagar, and Gangasagar (Image 3.1C). On Sagar Island, in the village of Beguakhali, the government has intervened by investing in adaptation in-situ (a large-scale coastal embankment), whilst in the village of Dhablat, there was no government intervention (Mortreux et al., 2018) (Image 3.1C). These three sub-populations – Relocated, Adapted In-Situ, and Non-Adapted – are the focus of this study.

Sagar Island is selected as a fieldsite for several reasons. First, people's exposure to environmental risks and high levels of vulnerability make it a relevant site for studying climate change adaptation. Second, different forms of government action and inaction – including Planned Relocation, Adaptation In-Situ, and Lack of Adaptation – have occurred across Sagar Island. This allows for a comparative analysis among sub-populations similar in terms of their exposure to environmental risks, levels of vulnerability, and socio-cultural background. Third, this fieldsite has already been the focus of research conducted at the University of Exeter as part of the 'Deltas, Environment and Climate Change: Migration and Adaptation' (DECCMA) project. The benefits of having baseline data and research support in Sagar Island are contributing factors to the feasibility of this study. Building upon DECCMA findings also increases the relevance and impact of findings.

### **a) Planned Relocation**

In the 1920s, Lohachara Island and Ghoramara Island were characterised by highly fertile paddy fields, abundant freshwater, and nutrient-rich soils (Das and Hazra, 2020). Since the 1950s, the islands, however, experienced high rates of coastal erosion (Das and Hazra, 2020; Ghosh et al., 2014). This led to the submergence of Lohachara Island in 1991 and the loss of over 70% of Ghoramara Island (Ghosh et al., 2014; Hazra and Samanta, 2016). In the 1970s,

in response to this situation, the government of West Bengal declared the islands 'no man's land'. They withdrew funding for support and services with no plan on how to deal with the local populations (Mukhopadhyay, 2009). The loss of land degraded ecosystem services and affected the livelihoods of the many depending on natural resources. This also led to high rates of out-migration and displacement, with around 4,000 residents of Lohachara Island and Ghoramara Island leaving since 1971 (Ghosh et al., 2014). Many more, however, remained on the islands, exposed to environmental risks and with limited capacity to adapt (Mortreux et al., 2018).

In 1977 a change of government took place, with the incoming Communist Party introducing planned relocation policies for the residents of the two islands. Until the 1990s, there was a sustained government action to relocate displaced households from Lohachara Island and Ghoramara Island to Sagar Island (Das and Hazra, 2020). Sagar Island was chosen as it was adjacent, found itself in the same jurisdiction, and had land available for planned relocation (Mortreux et al., 2018). Households were relocated to Gangasagar (with an area of 12.26 km<sup>2</sup> and a total population of 10,340 among which 5,228 males and 5,112 females)



*Image 3.2. A typical dwelling and pond that was given to Relocated individuals in the first stages of the Planned Relocation (left) and the inside of the dwelling (right).*



(Census of India, 2011b), Bankimnagar (with an area of 3.07 km<sup>2</sup> and a total population of 3,885 among which 2,031 males and 1,854 females) (Census of India 2011c), and Kamalpur (with an area of 5.6 km<sup>2</sup> and a total population of 6,602 among which 3,397 males and 3,205 females) (Image 3.1C) (Census of India, 2011d). The first households to be relocated were those living on the coastal areas of Lohachara Island and Ghoramara Island and that lost their dwellings and agricultural lands. The first group of relocated households were invited to choose from different locations on Sagar Island that the government assigned for relocated settlements. These first relocated households were given plots of land (3 Bighas), a dwelling and a pond (Image 3.2).

As the Planned Relocation continued, the Government of West Bengal began to run out of land on Sagar Island (Mortreux et al., 2018). The following groups of relocated households were given increasingly less land (2.5 - 0.5 Bighas), with many being given forested or saline plots of land and no dwelling nor pond. In the 1990s, the Planned Relocation ceased due to the broader economic decline in West Bengal affecting government spending and a lack of available public land on Sagar Island (Das and Hazra, 2020).



Image 3.3. View from a dwelling on the coast of Ghoramara Island (left) and the inside of the dwelling (right).

Those still living on the coastal areas of Ghoramara Island lack the means to move, consider themselves trapped, and are increasingly demanding to be relocated to safer areas (Image 3.3) (Stefancu, 2022; Das and Hazra, 2020). However, the current inhabitants of Ghoramara Island are not the focus of this study. The Relocated households had to deforest or desalinize the land and build their dwellings, especially those relocated in the final stages of the Planned Relocation. In the meantime, they were left unable to cultivate their new land for subsistence, jobless, and without financial support from the government. The host communities, however, offered support to those relocated by offering them shelter whilst building their dwellings and daily labour opportunities. This allowed the relocated households to gradually make a living on Sagar Island and integrate with the host communities.

#### **b) Adaptation In-Situ**

In the case of Beguakhali the government action did not consist in planned relocation. Instead, it consisted in short-term disaster relief and long-term investments in coastal protection infrastructure in order to adapt the population in-situ (Mortreux et al., 2018). Beguakhali is a village located on the Southwest coast of Sagar Island (Image 3.1C), with an area of 6.49 km<sup>2</sup> and a population of 5,683 inhabitants, among which 2,911 males and 2,771 females (Census of India, 2011e). In May 2009, cyclone Aila hit the South coast of Sagar Island and displaced more than 150 households in Beguakhali. Short-term disaster relief in the aftermath of the cyclone was given, with those displaced being provided with basic relief such as food, water, and tarpaulins to build shelter (Irrigation and Waterways Department, 2014). The existing embankment was severely damaged, leaving the inhabitants of Beguakhali, and further afield in Dhablat, exposed to environmental risks.

In 2010, one year after cyclone Aila, the decision to rebuild an embankment in Beguakhali was publicly announced. A document review, however, shows that this development project was considered by the Kolkata Trust Port in 2002 and

was predominantly motivated by the Government of India's decision to develop a deep-sea port in Beguakhali for the transport of coal and iron ore (Kolkata Port Trust, 2018). However, the construction of the embankment did not start until 2015, leaving many displaced individuals in a precarious situation in the interim. Financial compensation was not given to those that lost their dwelling or agricultural land to cyclone Aila but only to those that lost their dwelling or agricultural land to the construction of the embankment.



Image 3.4. The embankment in Beguakhali (left) and the area between Beguakhali and Dhablat where the embankment ends (right).

Currently, the embankment has been completed (Image 3.4). The case of Beguakhali is an example of the government's tendency to delay or avoid implementing planned relocation. Despite the cyclone-induced displacement, planned relocation support has not been provided and the only action taken has been the adaptation in-situ, that aligns with broader development goals.

### **c) Lack of Adaptation**

Cyclone Aila breached the existing embankment. Consequently, over 50 households have been displaced in the Eastern side of Dhablat, a village ten

kilometres East of Beguakhali (Image 3.1C) (Irrigation and Waterways Department, 2014). The village of Dhablat has an area of 11.42 km<sup>2</sup> and a population of 6,778, among which 3,496 males and 3,282 females (Census of India, 2011f). As per the regional Disaster Management Plan's guidelines, displaced people were provided with basic relief, such as food, water, and tarpaulins (South 24 Parganas District, 2015). Similarly to the inhabitants of Beguakhali, many were left homeless and landless. Frequent flooding also leads to high levels of salinity intrusion, making the agricultural land on the coastal areas no longer cultivable.

There has been no planned relocation or interventions for adaptation in-situ in Dhablat. A small brick, wood, and mud embankment has been consolidated by the Irrigation and Waterways Department, but this is 100 metres inland from the dwellings regularly affected by flooding. The decision to consolidate the inland embankment rather than rebuild the coastal embankment is consistent with the Coastal Zone Regulations, where no social provisions or consultations are required to decide on the placement of embankments (Ministry of Environment and Forests, 2011). As a result, king tides flood the affected community regularly.



Image 3.5. Dwelling on the coastal area of Dhablat that has been damaged by floods and recurrent storms (left) and the coastal embankment in Dhablat (right).

The Western side of the village has never been protected by a coastal embankment and throughout the years, therefore, it remained exposed to storm surges, flooding, coastal erosion, and salinity intrusion. People in this area have



historically been large landowners whose land has almost completely eroded. Some report having had to retreat from the advancing waters as many as seven times. Residents living here find themselves placed between one of the main roads that crosses Sagar Island and the sea (Image 3.5).

Many households with the capacity to do so have migrated from Dhablat. The remaining households cannot afford to leave, therefore remaining trapped. The remaining population of Dhablat is highly marginalised and has limited capacity to adapt independently or resist government inaction. On the other hand, the government has no incentive to intervene. The result is a process of slow community abandonment where social services and infrastructure have broken down, and those who still live there lack the ability to move if they wish, in effect, becoming a trapped population (Black and Collyer, 2014).

### **3.3 Data collection**

#### **3.3.1 Unit of analysis and sampling strategy**

The unit of analysis for this study is the individual. Whilst many argue the need to expand beyond the individualist frames of reference for the conception of justice (Schlosberg, 2013), perceptions of fairness are most often investigated at individual level (Adger et al., 2016; Maguire and Lind, 2003; Syme et al., 1999). Similarly, many propose studying wellbeing from a subjective perspective by considering individuals' perceptions and experiences of their social environment (Camfield et al., 2009; Diener et al., 1998; Gasper, 2010).

The population of this study are the inhabitants of Sagar Island that are exposed to slow- and rapid-onset disasters and have been subject to uneven government action and inaction, namely Planned Relocation, Adaptation In-Situ, and Lack of Adaptation. Stratified sampling was used to divide the population into sub-populations that are individually more homogenous than the total population (Sharma, 2017). Specific locations that are representative of each of the sub-

populations were selected, such as: Bankimnagar, Gangasagar, Kamalpur (Relocated), Beguakhali (Adapted In-Situ), and Dhablat (Non-Adapted). The three sub-populations and the selection criteria for members of each of the sub-populations are listed in Table 3.2.

Sub-population	Selection criteria for members of each sub-population
<b>Relocated</b>	Individuals from Lohachara Island and Ghoramara Island vulnerable to environmental risks that have been relocated by the government and are now living in a relocation site on Sagar Island (Bankimnagar, Gangasagar, Kamalpur).
<b>Adapted In-Situ</b>	Individuals living on Sagar Island vulnerable to environmental risks that have been adapted in-situ by the government through the construction of an embankment (Beguakhali).
<b>Non-Adapted</b>	Individuals living on Sagar Island vulnerable to environmental risks that have not been adapted by the government (Dhablat).

Table 3.2. The selection criteria for members of each of the three sub-populations: Relocated, Adapted In-Situ and Non-Adapted.

Different sampling techniques were employed to sample participants from each of the three sub-populations (Table 3.3). These are explained in reference to each data collection method in 'section 3.3.2 Methods'.

Data collection	Sampling technique	Type of respondent	Number of respondents	
<b>Key informant interview</b>	Purposive sampling	Relocated community elder with knowledge about community-level issues and activities	1	Total n=8
		Adapted In-Situ community elder with knowledge about community-level issues and activities	1	
		Non-Adapted community elder with knowledge about community-level issues and activities	1	
		Fieldwork assistants with work experience on Sagar Island	2	
		Researchers whose work focuses on environment risk and adaptation in Sagar Island	2	
		Regional government official	1	
<b>Narrative interview</b>	Purposive sampling	Relocated	8	Total n=14
		Adapted In-Situ	3	
		Non-Adapted	3	
<b>Survey</b>	Convenience sampling	Relocated	74	Total n=222
		Adapted In-Situ	74	
		Non-Adapted	74	
<b>Semi-structured interview</b>	Purposive sampling	Relocated	8	Total n=14
		Adapted In-Situ	4	
		Non-Adapted	2	

Table 3.3. Sampling technique and sampling size in relation to each data collection method.

### **3.3.2 Methods**

This section presents the selected methods of data collection used for this study. All methods are chosen due to their suitability to the proposed research questions and their previous use in similar empirical studies. The data collection methods were developed with the support of a team of local research assistants to ensure that the topics of discussion raised were culturally and contextually sensitive. Local research assistants with experience in quantitative and qualitative data collection were employed to conduct the surveys and interviews in Bangla. A local guide was employed to help create a climate of trust between the local community and the research team. The chosen data collection methods are described below, following the order in which they have been used (Table 3.1).

#### **a) Key informant interviews**

Key informant interviews are qualitative in-depth interviews with people who have in-depth knowledge of a specific topic of interest (Gray, 2017; Hawtin and Percy-Smith, 2007; Lokot, 2021). This method was used in phase I of the empirical research. Secondary data was also collected and analysed for phase I. However, it provided only part of the information needed to comprehensively understand the sub-populations of interest: Relocated, Adapted In-Situ, and Non-Adapted. After the analysis of secondary data, a list of additional information that was needed was compiled, with primary questions formulated accordingly. In order to gather this data, interviews with key informants (n=8) were conducted on a variety of topics, including:

- Physical descriptions (e.g. information about exposure to environmental risks)
- Historical background (e.g. information about government action and inaction)
- People (e.g. information about demographics, religions, division in castes)
- Material resources (e.g. availability of services, infrastructure, occupation)
- Natural resources and land use (e.g. fisheries, livestock, crops)
- Human resources (e.g. education, migration patterns)
- Socio-political resources (e.g. political organisations, social stratification)

- Cultural resources (e.g. religious celebrations, beliefs)

The key informant interviews produced valuable knowledge because of the status and expertise of the key informants (Hawtin and Percy-Smith, 2007; Lokot, 2021). However, this method raises problematic assumptions about whose voices and knowledge are important (Lokot, 2021). The method's main limitation is its reliance on qualitative information from key informants who may not represent the whole range of views (Lokot, 2021; Payne and Payne, 2011). To overcome this limitation, different types of key informants were selected, as shown in Table 3.3. To select the key informants, purposive sampling was used. This type of sampling relied on the researcher's judgement to select participants that have the required knowledge and are willing to share it (Gray, 2017; Sharma, 2017).

The researchers, fieldwork research assistants, and regional government officials were sampled due to their involvement in the DECCMA (DELtas, vulnerability, and Climate Change: Migration and Adaptation) project, which focused on climate change and adaptation in deltaic environments, including the Ganges-Brahmaputra Delta. The Relocated, Adapted In-Situ, and Non-Adapted members were sampled with the support of the local guide, an inhabitant of Sagar Island who has first-hand knowledge of the sampled sub-populations and has worked as a fieldwork guide for the DECCMA project.

## **b) Narrative interviews**

In line with the understanding that valued wellbeing and fairness aspects should be defined by the people whose wellbeing and perceptions of fairness are being investigated (Woodhouse et al., 2015), narrative interviews (n=14) were conducted to determine context-specific aspects. This qualitative data collection method generated a story through the interview (Gray, 2017; Gough and McGregor, 2007; Woodhouse et al., 2015). Instead of placing emphasis on a question-answer format, the purpose of narrative interviews was to provide an opportunity for the participant to narrate their experience for the researcher. In

order to encourage participants to lead the conversations (Gough and McGregor, 2007; Woodhouse et al., 2015), participants were asked to:

- describe their lives from their youth to now and how they changed over time;
- describe their households and their communities;
- describe their experience of government action or inaction.

Particular attention was paid to how this was communicated when translating from English to Bangla. Terms such as ‘wellbeing’, ‘fairness’, and ‘justice’ were not used during the narrative interviews. Discussions were framed around a broad conception of wellbeing and respondents’ personal experience of government action and inaction. To select participants for the narrative interviews, purposive sampling was used. With the help of the local guide, participants were recruited in such a way as to ensure representation. Participants were sampled from each sub-population: Relocated, Adapted In-Situ, and Non-Adapted. The participants were selected in such a way as to represent the views of respondents of different gender, age (18-84 years old), religion (Hindu and Muslim), and caste (low, medium, and high) (Table 3.4). Residents of different relocated settlements were selected to investigate potential differences in opinion between individuals relocated at different points in time and in different locations.

N. Interview	Type of population	Location	Gender	Age	Religion	Caste
1	Relocated	Gangasagar	Male (x2)	76, 81	Muslim/Hindu	Middle
2	Relocated	Gangasagar	Male/Female	63/52	Hindu	Middle
3	Relocated	Gangasagar	Male	60	Hindu	Middle
4	Relocated	Kamalpur	Male	36	Muslim	Middle
5	Relocated	Kamalpur	Female (x3)	35/30/27	Muslim	Middle
6	Relocated	Kamalpur	Male (x2)	72/47	Muslim	Middle
7	Relocated	Bankimnagar	Male (x2)	84/40	Hindu	Lower
8	Relocated	Bankimnagar	Female	18	Hindu	Lower
9	Adapted In-Situ	Beguakhali	Male	68	Muslim	Middle
10	Adapted In-Situ	Beguakhali	Female	60	Hindu	Lower
11	Adapted In-Situ	Beguakhali	Male	30	Hindu	Middle
12	Non-Adapted	Dhablat	Male	48	Hindu	Middle
13	Non-Adapted	Dhablat	Female	60	Hindu	Upper
14	Non-Adapted	Dhablat	Male (x2)/Female	52/46/40	Muslim/Hindu	Middle

Table 3.4. Socio-demographic characteristics of narrative interview respondents.

### **c) Survey**

Surveys were used as part of a mixed methods approach to collect data on wellbeing and perceptions of fairness in Relocated, Adapted In-Situ, and Non-Adapted sub-populations. The results of phase II of the empirical research, which consisted in the development of theoretically valid and locally relevant criteria, were then used to develop the survey.

The survey was identical for all three sub-populations, apart from questions relating to the location-specific form of government action or inaction. Surveys were conducted with a maximum of one participant per household, which took 25-35 minutes to complete and were carried out at different times of the day and on randomly selected roads, with every third house being approached (convenience sampling) (Adger et al., 2016). The same number of participants (n=74) were approached from each sub-population. The surveys consisted of four parts, as shown below (Appendix 1).

#### 1. Introduction

This section recorded when and where the survey was conducted, whether the aim of the information sheet was explained, and whether the respondent gave informed consent to participate to the study.

#### 2. Socio-demographic information

This section recorded information on the respondent's gender, age, religion, caste, education, livelihood, employment status, and income.

#### 3. Wellbeing

This recorded past and present information on the respondent's material, subjective, and relational wellbeing.

#### 4. Perceptions of fairness

This section recorded information on respondent's perceptions of distributive and procedural fairness.

The survey was translated independently by two research assistants who then compared their versions and agreed on the final translation. The Bangla version

of the survey was then piloted to: (i) test whether the survey was suitable to answer the research questions, (ii) identify factors that will likely impact people's ability to understand the instructions and questions, and (iii) assess how long it takes to conduct the survey.

For the pilot, one male and one female respondent were sampled (convenience sampling) from each target sub-population – Relocated, Adapted In-Situ, and Non-Adapted – for a total of six participants. The research assistants asked the participants to respond to the survey questions, highlight any questions or instructions that confused or gave them difficulty, and explain what they thought the questions meant. Respondents' feedback was collated by the research assistants and discussed with the lead researcher. Revisions were made to reflect the given feedback. The revised survey was then re-piloted with the assistance of the lead researcher. The same number of participants and the same process was applied.

The final survey was uploaded to the World Bank's surveying software Survey Solutions. Through the Survey Solutions app, the survey was then conducted face-to-face by the research assistants and under the lead researcher's supervision. 222 surveys were conducted equally across the three sub-populations over a six-week period between October and December 2019. The response rate was 94.6% for the Relocated and Non-Adapted sub-populations and 95.9% for the Adapted In-Situ sub-population. The high response rate was due to two factors: the use of a local guide which introduced the research team and the project to the participants and the relationships established during the phase I and II of data collection.

Considering that initially the study employed stratified sampling to identify relevant sub-populations, so that differences between the sub-populations could be identified, the survey sample size was thus obtained by sampling an equal number of participants from each sub-population (n=74). This ensures a more realistic and accurate estimation of the wellbeing and perceptions of fairness differences among the differently relocated sub-populations. Stratified sampling improves the accuracy and representativeness of the results by reducing



sampling bias. The response rate and socio-demographic characteristics of the Relocated, Adapted In-Situ and Non-Adapted respondents are shown in Table 3.5.

<b>Socio-demographic characteristics</b>	<b>Relocated respondents</b>	<b>Adapted In-Situ respondents</b>	<b>Non-Adapted respondents</b>
Respondents			
Total	74	74	74
Participants	70	71	70
Member of household			
Household head	70%	47%	49%
Partner of household head	20%	27%	35%
Child of household head	5%	20%	7%
Other	5%	6%	9%
Gender	51%	52%	47%
Male	49%	48%	53%
Female			
Age range	23-85 years old	21-80 years old	27-70 years old
Religion			
Hindu	53%	87%	93%
Muslim	47%	13%	7%
Caste			
General	17%	10%	40%
Scheduled Castes	37%	75%	41%
Scheduled Tribes Castes	0%	1%	0%
Other Backward Class	46%	14%	19%
Education			
No schooling	44%	19%	24%
Class 1-3	19%	18%	10%
Class 4-5	20%	26%	26%
Class 6-8		22%	13%
Class 9-10		8%	14%
Class 11-12		7%	9%
Higher education			4%

Table 3.5. Socio-demographic characteristics of survey respondents.

#### d) Semi-structured interviews

Semi-structured interviews were used to complement the quantitative findings, as a combination of quantitative and qualitative approaches was found to be valuable in enhancing the explanatory power of the data (Camfield et al. 2009; Gasper, 2010; McGregor, 2004). In addition to the survey respondents, participants were also sampled for semi-structured interviews (n=14). Questions were asked about:

- Material circumstances
- Overall life satisfaction, expectations, aspirations, values and happiness
- Relations with family and community members
- Opinions on the relevant government action or inaction
- Personal experience with the decision-making process
- Opinions on the outcomes of the relevant government action or inaction

Phase	N. Interview	Population	Community	Gender	Age
II	1	Relocated	Kamalpur	Female	40
II	2	Relocated	Kamalpur	Male	54
II	3	Relocated	Kamalpur	Male	60
II	4	Relocated	Kamalpur	Female	55
II	5	Relocated	Bankimnagar	Male	76
II	6	Relocated	Bankimnagar	Male	45
II	7	Relocated	Bankimnagar	Female	72
II	8	Relocated	Bankimnagar	Female	70
II	9	Adapted In-Situ	Beguakhali	Female	101
II	10	Adapted In-Situ	Beguakhali	Male	54
II	11	Adapted In-Situ	Beguakhali	Male	45
II	12	Adapted In-Situ	Beguakhali	Female	45
II	13	Non-Adapted	Dhablat	Male	60
II	14	Non-Adapted	Dhablat	Male	60

Table 3.6. Socio-demographic characteristics of semi-structured interview respondents.

Purposive sampling was used to select participants for the semi-structured interviews. With the help of the local guide, participants were recruited in such a way as to ensure representation of different sub-populations and diverse members of each sub-population. Participants were sampled from each of the three sub-populations: Relocated, Adapted In-Situ, and Non-Adapted. The participants were selected in such a way as to represent the views of respondents

of different gender, age (40-101 years old), religion (Hindu and Muslim), and caste (low, medium, and high) (Table 3.6).

### **3.4 Data analysis**

In answering the research questions 1.1 '*What aspects of wellbeing are valued by the three unevenly adapted sup-population?*' and 2.1 '*What aspects of fairness are valued by the three unevenly adapted populations?*', the narrative interviews were analysed in NVIVO using a thematic qualitative analysis approach. The thematic analysis consisted of identifying themes in the data that were relevant in answering the posed research questions (Braun and Clarke, 2006; Vaismoradi, 2013). Aspects of wellbeing and fairness were allowed to emerge from the data. These were then defined to represent the manner in which Relocated, Adapted In-Situ, and Non-Adapted respondents used them. This list of wellbeing and fairness aspects and their definition was then compared to wellbeing and fairness criteria commonly used in empirical research. It appeared that no novel aspects of wellbeing or fairness were identified. This process, however, ensured that the criteria used for the development of the survey and the semi-structured interviews were both theoretically valid and locally relevant. This list of criteria was also used to inform a coding frame that was then used in the thematic content analysis of the semi-structured interviews.

The survey was analysed in SPSS using a range of statistical analysis tests. Initially, descriptive statistics were performed. Measures of frequency, central tendency, and dispersion were used to give a broad overview of the responses of the Relocated, Adapted In-Situ, and Non-Adapted participants in relation to research questions 1.2, 1.3, 2.2, and 2.3 (Table 3.1). The most relevant results are included in Chapter 4 and Chapter 5. The semi-structured interviews were analysed in NVIVO using a thematic qualitative analysis approach. The analysis consisted in applying the coding frame identified as theoretically valid through the literature review and locally relevant through the analysis of the narrative interviews. These qualitative results are presented throughout Chapter 4, Chapter 5, and Chapter 6.

In answering the research question 1.2, *'How is government action and inaction affecting the material, subjective, and relational wellbeing of the three unevenly adapted sub-populations?'*, Wilcoxon signed-rank and Sign tests were performed. Considering that the research question involved a comparative analysis of wellbeing within sub-populations, Wilcoxon signed-rank and Sign tests were used to determine whether there was a median difference between past and present subjective wellbeing in each of the three sub-populations: Relocated, Adapted In-Situ, and Non-Adapted (King and Eckersley, 2019; Albers, 2017). When running the Wilcoxon signed-rank test, the data met the three required assumptions: (i) an ordinal dependent variable, (ii) an independent variable consisting of two categorical, related groups, and (iii) a distribution of the differences between the two related groups symmetrical in shape (Laerd, 2022a; King and Eckersley, 2019; Freund et al., 2010). When the last assumption was not met, a Sign test was conducted instead, which is the recommended alternative to the Wilcoxon signed-rank test (Laerd, 2022b; King and Eckersley, 2019; Freund et al., 2010).

In answering the research question 2.2, *'How is government action and inaction affecting the perceptions of distributive and procedural fairness of the three unevenly adapted sub-populations?'*, a combination of descriptive statistics and thematic content analysis results are presented. No additional statistical tests are performed.

In answering the research questions 1.3 *'How does wellbeing compare among the three unevenly adapted sub-populations?'* and 2.3 *'How do perceptions of fairness compare among the three unevenly adapted sub-populations?'* Kruskal-Wallis H tests were performed. Considering that the research questions involved a comparative analysis of wellbeing and perceptions of fairness, the Kruskal-Wallis H tests were used to determine if there were statistically significant differences between the Relocated, Adapted In-Situ, and Non-Adapted sub-populations. Whilst the Kruskal-Wallis H tests determined whether the independent variable (sub-population) had an effect on a dependent variable (subjective wellbeing or perceptions of fairness), it did not describe how the sub-

populations differ from each other. Therefore, Dunn's procedure with a Bonferroni correction for multiple comparisons was employed to identify where these differences lie (Laerd, 2022c; King and Eckersley, 2019). The results of these procedure shed lights on whether there were statistically significant differences between all pairwise comparisons, namely Relocated – Adapted In-Situ, Relocated – Non-Adapted, and Adapted In-Situ – Non-Adapted.

In answering the research question 3, '*Do perceptions of fairness influence the wellbeing of unevenly adapted sub-populations?*', two statistical tests were performed to assess the potential relationship between perceptions of fairness and subjective wellbeing. First, an assessment of whether the perceptions of fairness and subjective wellbeing variables have a monotonic relationship was performed. Neither of the 48 perceptions of fairness – subjective wellbeing pairings showed a monotonic relationship. Second, Spearman's rank-order correlations were also performed to measure the strength and direction of the relationship between the two ordinal variables of interest: perceptions of fairness and subjective wellbeing. The existence of a monotonic relationship between the two variables is an assumption of Spearman's rank-order correlation. Whilst monotonicity of relationships is an assumption of Spearman's rank-order correlation test, this was performed to confirm the results of the first assessment and ensure there were no methodological errors.

## Chapter 4. The impact of government action and inaction on wellbeing

People exposed to environmental risks can experience adverse wellbeing impacts. In addition, government action and inaction in the context of climate change adaptation can have a complex impact on people's wellbeing. Therefore, the concept of wellbeing is highly relevant in understanding the impacts of government action and inaction. The first aim of the study is thus to investigate the wellbeing of unevenly adapted sub-populations: Relocated, Adapted In-Situ, and Non-Adapted. This chapter aims to answer the first research question:

- 1. How is the wellbeing of populations exposed to environmental risks affected by government action and inaction?*

The chapter is divided into three sections, each addressing one of the research sub-questions. The first section addresses the first research sub-question: '*What aspects of wellbeing are valued by unevenly adapted sub-populations?*'. This section presents a contextual understanding of the most valued aspects of wellbeing according to Relocated, Adapted In-Situ, and Non-Adapted sub-populations. The results highlight valued aspects of wellbeing and the importance of material, subjective, and relational dimensions, ultimately resonating with studies suggesting that wellbeing should be seen as multidimensional.

The second section addresses the second research sub-question: '*How is government action and inaction affecting the material, subjective, and relational wellbeing of the three unevenly adapted sub-populations?*'. This second section describes the wellbeing of Relocated, Adapted In-Situ, and Non-Adapted sub-populations and the changes in their wellbeing caused by uneven adaptation interventions. It does so by describing current material, subjective, and relational wellbeing aspects and assessing how these have changed over time: for the Relocated sub-population, a comparison between the present time and the time prior to being relocated; for the Adapted In-Situ sub-population, a comparison between the present time and the time before the embankment being built; and for the Non-Adapted sub-population, a comparison between the present time and

the time before the exacerbation of environmental risks. While evaluations of planned relocation commonly focus on their impact on the wellbeing of individuals after the intervention, this study compares wellbeing before and after the intervention to assess whether the planned relocation has improved or worsened the individuals' circumstances.

The third section addresses the third research sub-question: '*How does wellbeing compare among the three unevenly adapted sub-populations?*'. This section presents a comparison of wellbeing across the three sub-populations. While evaluations of planned relocation commonly focus on the wellbeing of relocated individuals and overlook the consequences of not intervening, this study compares between Relocated, Adapted In-Situ, and Non-Adapted sub-populations.

The results presented in the first section are drawn from narrative interviews (n=14), which have been conducted to explore valued aspects of wellbeing in Relocated, Adapted In-Situ, and Non-Adapted sub-populations. These have been used to inform the development of wellbeing criteria across material, subjective, and relational dimensions in a theoretically valid and locally relevant way. These material, subjective, and relational criteria have then been used to develop the survey (n=222) and additional semi-structured interviews (n=14), which have been presented in the second and third sections of this chapter.

#### **4.1 Valued aspects of wellbeing**

Before collecting data on wellbeing, a contextual understanding of aspects of wellbeing that are valued by the three sub-populations under investigation (Relocated, Adapted In-Situ, and Non-Adapted) is sought. This first phase of the empirical investigation sheds light on aspects of wellbeing that are valued by socially marginalised individuals who are exposed to environmental risks, have limited adaptive capacity, and have been unevenly adapted. These locally relevant aspects of wellbeing are drawn from narrative interviews (n=14) with Relocated, Adapted In-Situ, and Non-Adapted respondents of different gender,

age, religion, and caste (see Chapter 3 section 3.3.2b for an in-depth description of the data collection method and the socio-demographic information of Relocated, Adapted In-Situ, and Non-Adapted respondents). The results reported below represent the views of the three sampled sub-populations.

Relocated, Adapted In-Situ, and Non-Adapted respondents assess their wellbeing in terms of material, subjective, and relational aspects. The respondents speak of these aspects in a way that demonstrates the importance and influence of one upon the other. These results are consistent with the social science literature that frames wellbeing as a multidimensional construct and highlights the interrelatedness of these three dimensions.

Relocated, Adapted In-Situ, and Non-Adapted respondents assess their wellbeing in terms of their material circumstances. Material circumstances are often discussed in relation to livelihoods, tenure of agricultural land, and housing conditions (Figure 4.1). Respondents explain their traditional reliance on subsistence agriculture and speak of agricultural land tenure as an issue of utmost importance. They discuss at length the negative repercussions of their exposure to environmental risks, such as coastal erosion and salinity intrusion, on the size and quality of agricultural lands. The impact of such risks is also discussed in relation to housing conditions. Issues related to decreased land availability and productivity are often discussed in conjunction with a lack of livelihood diversification opportunities and framed as a major source of economic and food insecurity.

When speaking about their material circumstances, Relocated, Adapted In-Situ, and Non-Adapted respondents do not speak only in objective terms but also in terms of their subjective wellbeing. They often relate their material conditions to satisfaction or dissatisfaction with different aspects of life. For example, respondents reflect on how satisfied or unsatisfied they are with the natural environment, housing conditions, economic security, and food security among other aspects. The analysis of these recounts shows how material and subjective aspects of wellbeing come together in an intricate way when reflecting on life satisfaction.





Figure 4.1. Valued aspects of material, subjective and relational wellbeing.

Overall, Relocated, Adapted In-Situ, and Non-Adapted respondents speak about their lives and wellbeing in collective rather than individual terms, positioning themselves as relational selves, and thus highlighting the importance of relational wellbeing. This seems to be an integral part of the social fabric of the communities under study. There are differences in experience across the three sub-populations, but the sense of being in a relationship dominates how respondents describe their personal histories. Material, subjective, and relational aspects merge. For example, questions about happiness lead to answers about economic security, with ‘having enough’ being described as being able to share with others and being with others as a reason for happiness.

Through these initial narrative interviews, this study validates the importance of material, subjective, and relational dimensions of wellbeing and identifies locally

relevant aspects for each dimension. When comparing these qualitative findings against criteria of wellbeing identified across the social science literature, it transpires that these locally relevant aspects have been extensively used in other empirical studies. This means that the study's chosen wellbeing criteria are theoretically valid and locally relevant.

## **4.2 A comparison of wellbeing before and after government action and inaction**

### **4.2.1 A guidance on how to navigate the results sections on comparisons of wellbeing over time**

This section presents a comparison of material, subjective, and relational criteria of wellbeing before and after the government action and inaction, namely Planned Relocation, Adaptation In-Situ, and Lack of Adaptation. The results are drawn from a combination of quantitative (surveys n=222) and qualitative (semi-structured interviews n=14) data analysis in order to triangulate findings and enhance the explanatory power of the presented data. It is worth highlighting here that the results of the narrative interviews are used to understand locally valued aspects of wellbeing and inform the development of semi-structured interviews. The results of the semi-structured interviews are used to provide a detailed understanding of the material, subjective, and relational circumstances of the three sub-populations.

The following sections of this chapter present the differences in wellbeing before and after the Planned Relocation, Adaptation In-Situ, and Lack of Adaptation. Results on material wellbeing are presented in terms of wealth indicators such as land tenure (ownership of dwelling, size of dwelling, and size of agricultural land), housing quality (roofing, source of drinking water, and sanitation), and livelihoods. Results on subjective wellbeing are presented in terms of happiness and life satisfaction, with ten life satisfaction domains included (natural environment, work opportunities, economic security, food security, drinking water, health, housing, children's education, family relations, and community relations). Results on

relational wellbeing are presented in terms of aspects of relational selves, community relations, and societal structures.

The three sections below present the comparative wellbeing assessment in the Relocated sub-population (section 4.2.2), in the Adapted In-Situ sub-population (section 4.2.3), and in the Non-Adapted sub-population (section 4.2.4). In order to aid the reader in navigating the below results sections, a colour coding system is applied throughout the chapter. The relevant figures and graphs are either in blue (for results related to the Planned Relocation), in green (for results related to the Adaptation In-Situ), or in orange (for results related to the Lack of Adaptation).

The changes in material wellbeing are depicted in Figure 4.2 (for results related to the Planned Relocation), Figure 4.4 (for results related to the Adaptation In-Situ), and Figure 4.6 (for results related to the Lack of Adaptation). Measures of frequency and central tendency are indicated in relation to several wealth indicators, with values in black indicating the results prior to the Planned Relocation, Adaptation In-Situ, and Lack of Adaptation and values in blue, green, or orange indicating the results in the present time respectively. Primary, secondary, and tertiary livelihoods are indicated by the roman numbers I, II, and III.

The changes in subjective wellbeing are depicted in Figure 4.3 (for results related to the Planned Relocation), Figure 4.5 (for results related to the Adaptation In-Situ), and Figure 4.7 (for results related to the Lack of Adaptation). Measures of central tendency (median and mode) are indicated in relation to 'happiness' and 'life satisfaction' indicators, with values in black indicating the results prior to the Planned Relocation, Adaptation In-Situ, and Lack of Adaptation and values in blue, green, or orange indicating the results in the present time respectively. The results of inferential statistical tests (Wilcoxon signed-rank test or Sign test) are reported in the figures as 'Positive' (indicating the percentage of respondents that perceive a positive change in wellbeing in the present compared to the past), 'Negative' (indicating the percentage of respondents that perceive a negative change in wellbeing in the present compared to the past), and 'Ties' (indicating

the percentage of respondents that does not perceive a change in wellbeing in the present compared to the past). Throughout the presentation of these results in text, z scores (test statistic result),  $p$ -values (statistical significance, with  $p < .05$  indicating a statistically significant result), and measures of frequency are also presented. The changes in relational wellbeing are drawn from the thematic analysis of semi-structured interviews.

#### **4.2.2 Wellbeing before and after the Planned Relocation**

##### **a) Material wellbeing**

On average, Relocated respondents report an improvement in dwelling tenure and conditions compared to their housing conditions prior to the Planned Relocation. 86% of respondents report that they were squatting on Lohachara Island and Ghoramara Island. Binay, a 45-year-old man describes how he lost his dwelling as well as all agricultural lands and found himself living with his family on the streets of Ghoramara Island:

*“That road is where we used to live.”*

Currently, 99% of respondents who have been relocated to Sagar Island own their dwelling (Figure 4.2). The households that were relocated first report having received a plot of land, a dwelling, and a pond, whilst subsequent households received increasingly smaller plots of land and no dwelling or pond. In time, however, they report having built themselves a dwelling on the plot of land they received on Sagar Island, which they currently own. Sumana, 70-year-old women explains that whilst the dwelling that was given to her family as part of the Planned Relocation was small and did not comfortably fit all her family members, this new dwelling represents an improvement in her family’s housing conditions. She reflects on her family’s ability to live in a dwelling on Sagar Island, as opposed to squatting on Ghoramara Island, which gives her a sense of peace and safety:

## The Material Wellbeing of the Relocated sub-population

### Dwelling tenure



	Past	Present
Owning	10%	99%
Renting	4%	0%
Squatting	86%	1%

### Dwelling size



	Past	Present
Mode	0.50 Kattha	1.00 Kattha

### Land size



	Past	Present
Mean	0.00 Bigha	0.77 Bigha

### Roofing



	Past	Present
Stone/ brick/ slate	6%	40%
Cement/ tiles/ asbestos	0%	54%
Plastic/ polythene	19%	0%
Hay/ branches/ jute bags	74%	6%

### Drinking water source



	Past	Present
Standpipe	4%	0%
Tubewell/ borehole	91%	100%
Surface water	4%	0%

### Sanitation



	Past	Present
Pit latrine	1%	70%
No facility	99%	7%
Temporary	0%	23%

### Livelihoods



	Past			Present	
Crop farmer				I 13%	II 1%
Livestock farmer		II 3%	III 1%	I 1%	II 1%
Fish/ shrimp farmer		II 6%			
Fishing	I 42%	II 13%		I 6%	II 1%
Salaried employee				I 3%	
Small business owner				I 1%	II 1%
Construction worker				I 3%	
Domestic employee	I 1%	II 4%	III 4%		II 1%
Guard/ gardener	I 1%	II 1%		I 1%	
Daily labourer	I 49%	II 28%	III 1%	I 13%	II 16%
Unemployed				I 10%	
Housewife				I 42%	

Figure 4.2. A comparison between past (indicated in black) and present (indicated in blue) material wellbeing in the Relocated sub-population.

*“We got peace here, like somehow we got a roof to save our head.”*

Before the Planned Relocation, only 10 out of 70 respondents report to have been living in a dwelling, either owned or rented, with most respondents reporting a dwelling size of 0.50 Katthas<sup>1</sup> (a Kattha is a unit of area mostly used for land and in West Bengal equals to approximately 720 sq. ft. / 66.8 sq. m.). With regards to their dwellings in the present time, most respondents report a dwelling size of 1 Kattha<sup>2</sup> (Figure 4.2). Overall, the size of the dwelling increased after the Planned Relocation. It is worth noting that those that were relocated first and received a dwelling as part of the Planned Relocation report having been able to expand it over time. Those relocated last that have not received a dwelling report having had to find the means and build their own dwelling. These latter types of Relocated households now live in smaller dwellings compared to those that were relocated in the initial stages of the Planned Relocation.

The amount of land available – whether used for crops, livestock, or aquaculture – is reported as of particular importance to Relocated respondents as they have traditionally relied on subsistence agriculture. Despite most respondents having many Bighas of land prior to the coastal erosion of Lohachara Island and Ghoramara Island, only one respondent had 2 Bighas of land left on Ghoramara Island when presented with the opportunity to relocate (a Bigha is a unit of area mostly used for land and in West Bengal equals to approximately 14,400 sq. ft. / 0.13 ha.). 99% of Relocated respondents report having no land left. When asked about the amount of land available on Ghoramara Island, Sumana responds:

*“Then [before the Planned Relocation] that [the situation] was like taking a turn on the butcher’s block. From there [Ghoramara Island] to here [Sagar Island] a new life. Here [on Sagar Island], we were given land, somehow, we are spending our days.”*

---

<sup>1</sup> The mode is reported. Past dwelling size data is normally distributed: skewness = 1.16 (standard error = 0.687); kurtosis = - 0.49 (standard error = 1.334); Shapiro-Wilk’s test ( $p > .05$ ).

<sup>2</sup> The mode is reported. Present dwelling size data is not normally distributed: skewness = 3.92 (standard error = 0.289); kurtosis = 1.92 (standard error = 0.570); Shapiro-Wilk’s test ( $p < .05$ ).

She describes her circumstances as ‘taking a turn on the butcher’s block’. She uses this metaphor to describe how the continuous loss of agricultural land on Ghoramara Island made her feel like she was waiting for her turn to be ‘slaughtered’. This is meant to represent the idea of losing agricultural land as a way of losing the means for subsistence. Throughout the interview, she explains that she did not know how her family would survive without agricultural land. She also reflects on being relocated to Sagar Island and says that the Planned Relocation has given her ‘a new life’.

Currently, the average farm size is 0.77 Bigha<sup>3</sup> (Figure 4.2). However, 29% of respondents, primarily those relocated in the last stages of the Planned Relocation, report not having agricultural land. This is of particular importance as land accessibility is reported as central to perceived wellbeing. Within this context, a distinction must be made between the impact of the Planned Relocation in terms of land tenure between households relocated in the first stages and those relocated in the last stages. The latter type of household has not experienced an improvement in material circumstances related to land tenure and therefore has not experienced an improvement in the ability to practice subsistence agriculture. On the other hand, households relocated first report an improvement in their material circumstances because of the ability to return to traditional agricultural practices.

Before the loss of agricultural land on Ghoramara Island, respondents report relying on traditional subsistence agricultural practices. However, during the year before the Planned Relocation, no respondents report being crop framers and only three respondents flag livestock farming as their secondary or tertiary livelihood. The most commonly reported form of livelihood at the time is daily labour work, with 49% of respondents flagging it as their primary livelihood and 28% of respondents flagging it as their secondary livelihood. 42% of respondents also report fishing as their primary livelihood (Figure 4.2). Currently, 14% of

---

<sup>3</sup> The mean is reported. Present farmland size data is normally distributed: skewness = 0.83 (standard error = 0.287); kurtosis = -1.69 (standard error = 0.566); Shapiro-Wilk’s test ( $p > .05$ ).

respondents flag crop farming as their primary or secondary livelihood. These results highlight the above discussion on land availability and the importance of farmland for Relocated individuals. Improvements in material wellbeing as far as livelihoods are concerned are also reported in terms of livelihoods diversification. Since moving to Sagar Island, respondents report having access to a broader range of work opportunities, with some Relocated respondents being regular salaried employees, construction workers, small business owners, and transporter workers.

All female respondents report having become unpaid housewives after the Planned Relocation whilst having to work before the government intervention. This is an indication of an improvement in material wellbeing. Relocated respondents report that women are traditionally responsible for managing the household and rearing children. Before the Planned Relocation they had to find work to contribute to the support of their households. Since the Planned Relocation, however, due to a partial return to crop farming and livelihood diversification opportunities, men can support their households on their own.

As far as housing quality is concerned, Relocated respondents report an improvement as far as roofing and sanitation are concerned. Whilst before the Planned Relocation, the few respondents that were still living in a dwelling had hay (74%) or plastic (19%) roofing and no sanitation facilities (99%), now the majority of respondents have stone (40%) or cement (54%) roofing and access to a pit latrine (70%). Although the drinking water source is not flagged as a particular concern before the Planned Relocation, now 100% of the Relocated respondents have access to a tubewell.

## **b) Subjective wellbeing**

Overall, the Planned Relocation led to an improvement in respondents' subjective wellbeing in terms of 'happiness' and five out of ten 'life satisfaction' indicators (Figure 4.3). The Planned Relocation elicited an improvement in happiness in 74% of participants, with a statistically significant median increase in levels of



happiness before the Planned Relocation (1 very unhappy) compared to after the Planned Relocation (3 neither happy nor unhappy),  $z = - 6.09$ ,  $p < .001$ . 40% of Relocated respondents report being moderately happy at the time of the study.

Regarding differences in life satisfaction before and after the Planned Relocation, respondents' satisfaction with the natural environment and housing has improved the most. 89% of Relocated respondents report being more satisfied with the natural environment in the present time, with a statistically significant median increase from before the Planned Relocation (2 moderately unsatisfied) compared to after the Planned Relocation (4 moderately satisfied),  $z = - 6.84$ ,  $p < .001$ . The exposure to environmental risks that respondents were facing prior to the Planned Relocation led to 87% of respondents feeling very or moderately unsatisfied. Sumana explains how vulnerable her family was when living on Ghoramara Island:

*“What to do? Will we get flooded there and die.”*

She says, 'what to do', referring to her family's limited adaptive capacity. Throughout the interview, she explains that she felt it was out of her power to do anything to decrease her family's exposure to environmental risks. If the government had not intervened, the only outcome she thought possible was to 'get flooded and die'. The current environmental conditions on Sagar Island are unsatisfactory to only one respondent. 93% of Relocated respondents report being very or moderately satisfied with the natural environment.

Similarly, 98% of Relocated respondents report being more satisfied with the housing conditions at the time of the study (Figure 4.3). This represents a statistically significant median increase from before the Planned Relocation (1 very unsatisfied) to after the Planned Relocation (4 moderately satisfied),  $z = - 7.94$ ,  $p < .001$ . The lack of safe housing led to 99% of respondents feeling very or moderately unsatisfied with the housing conditions on Lohachara Island and Ghoramara Island. On the contrary, 91% of respondents report being very or moderately satisfied with their housing conditions on Sagar Island.

## The Subjective Wellbeing of the Relocated sub-population

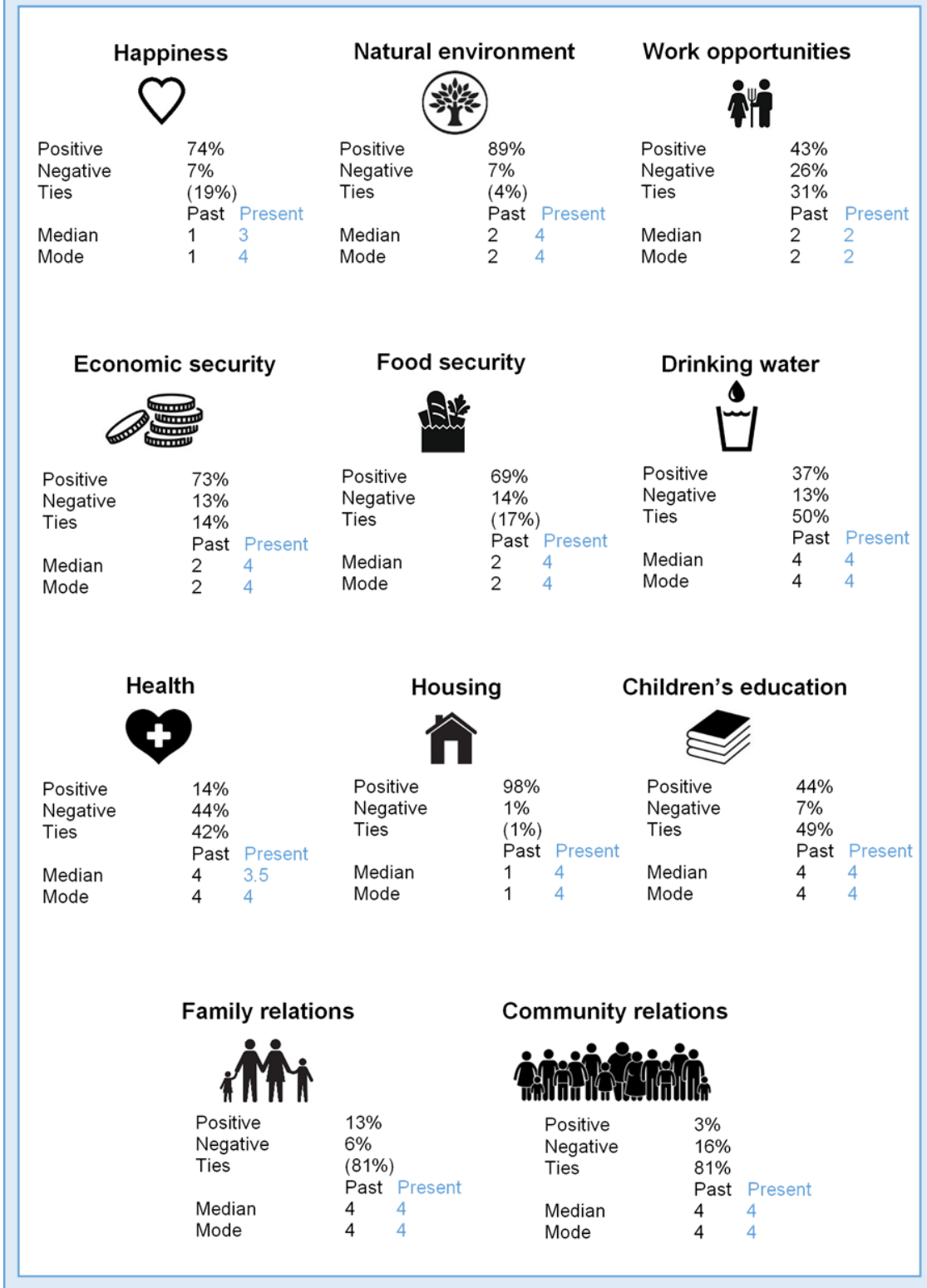


Figure 4.3. A comparison between past (indicated in black) and present (indicated in blue) subjective wellbeing in the Relocated sub-population.

As seen in the material wellbeing section, most respondents used to squat prior to the Planned Relocation, so the new dwellings on Sagar Island, whether bigger (for individuals relocated first) or smaller (for individuals relocated last) are an improvement in housing conditions leading to significantly higher levels of life satisfaction.

Following the levels of satisfaction with the natural environment and housing, the aspects of subjective wellbeing that have improved the most post Planned Relocation are economic and food security. 73% of respondents report an increased level of satisfaction with economic security (Figure 4.3), with a statistically significant median increase from before the Planned Relocation (2 moderately unsatisfied) to after the Planned Relocation (4 moderately satisfied),  $z = -4.99, p < .001$ . Similarly, 69% of respondents report an increased level of satisfaction with food security (Figure 4.3), with a statistically significant median increase from before the Planned Relocation (2 moderately unsatisfied) to after the Planned Relocation (4 moderately satisfied),  $z = -4.85, p < .001$ . Roorpleena, a 55-year-old woman that has been relocated to Sagar Island, explains the extent of the lack of food security prior to the Planned Relocation:

*“I had a son then [...] He was crying so much. He was hungry. I was helpless! Then it was difficult to get three square meals a day.”*

She recounts how she could not feed her child who was crying from hunger. Her inability to provide for her child made her feel ‘helpless’. She describes the precariousness of food security at the time, explaining that it was difficult to have three meals a day. When asked whether the situation is different now, she responds:

*“Compared to earlier [on Ghoramara Island], now my family are getting food.”*

As seen in the material wellbeing section, the Relocated respondents experienced an increase in available farmland, from an average of 0 Bigha before the Planned Relocation to 0.7 Bigha after the Planned Relocation. This led to households being able to return to crop farming, leading to increased levels of satisfaction with their economic and food security. Another contributing factor to

this amelioration is the increased work opportunities available, which lead to livelihood diversification prospects. 43% of respondents report higher levels of satisfaction with work opportunities after the Planned Relocation, even though the median increase was not statistically significant  $z = -1.58, p = .112$ .

Life satisfaction aspects that see no significant difference between pre and post Planned Relocation are drinking water, children's education, family relations, and community relations. 50% and 49% of respondents report that the Planned Relocation neither improved nor worsened their satisfaction with drinking water and children's education, respectively (Figure 4.3). Both subjective wellbeing aspects have a median of 4 (moderately satisfied) for both pre and post Planned Relocation results. Interview respondents explain that despite the environmental degradation on Lohachara Island and Ghoramara Island, they were able to access tubewells to source their water safely. As far as children's education is concerned, 44% of respondents describe that the Planned Relocation elicited an improvement. This is due to increased economic security, leading to an increase in disposable income that can be spent on children's education.

Family and community relations appear to have always been strong, with respondents reporting having been moderately satisfied with both types of relations pre and post Planned Relocation. Family relations have slightly improved for 13% of respondents due to decreased stress associated to environmental risks and economic and food security concerns. On the other hand, community relations have slightly worsened, according to 16% of respondents. They explain that community relations were tense between host and Relocated communities during the initial period after the Planned Relocation. Over time, people got to know each other better and formed stronger relationships, and Relocated individuals started to rely on food donations and work opportunities from the host communities. As trust increased between communities, stronger bonds formed. Many Relocated respondents reminisce, however, about the social interactions they had growing up on Lohachara Island and Ghoramara Island and say that those bonds could never be replaced. Whilst new social attachments have been formed, the old ones are yearned.

Satisfaction with health is the only subjective wellbeing aspect that decreased for 44% of respondents. This response, however, appears to be due to the aging process, more so than the impacts of the Planned Relocation. This result can be justified in this way as the above presentation of Relocated respondents' wellbeing shows that their exposure and vulnerability to environmental risks decreased, and overall material and subjective wellbeing increased.

### **c) Relational wellbeing**

Relational wellbeing emerges as a particularly important wellbeing aspect for the Relocated sub-population. Relocated respondents appear to make sense of their circumstances not as individuals but as part of a community with its members facing the same difficulties. For example, Anusha, a 72-year-old woman from Ghoramara Island, says:

*“We were one island which was gradually vanishing.”*

She speaks of the group of people living on the coastal areas of Ghoramara Island exposed to severe environmental risks as ‘we’. She also describes the community and the island as the same entity by saying, ‘we were one island’. She equates the process of the ‘vanishing’ of the island to that of its inhabitants. Similarly, Hem, a 45-year-old respondent from Lohachara Island, says:

*“Yes, [Lohachara Island is] gone, all the people of Lohachara were destroyed.”*

Hem, similarly to Anusha, refers to Lohachara Island and its people as a unit and describes the fate of the natural environment and the people inhabiting it using the same terms. Here, Hem refers to the people of Lohachara as ‘destroyed’ due to the submergence of the island. Relocated respondents speak of their social lives on Lohachara Island and Ghoramara Island extensively. The attachment to Ghoramara Island was primary due to communal living and the practical support that members of the community would offer to one another. Ansar, a 76-year-old male, says:

*“The [social] environment of Ghoramara was very good. If anything has happened to someone then everyone will come running for help.”*

He explains that whatever difficulty someone would face, the community would come together to help to the best of their abilities. This idea of community cohesion and reliance on other community members leads him to describe the social environment of Ghoramara Island as ‘very good’. Ansar compares this to his current circumstances on Sagar Island and concludes that the ability to rely on other community members has lessened. Interview respondents stress the importance of being able to rely on the community and help one another during challenging times. Relocated respondents report having a difficult time on Sagar Island as they were no longer living amongst people they could rely on. For example, Kaia, a 70-year-old woman, says:

*“At first the relationship was not very good.”*

She recounts that after arriving on Sagar Island, the relationship between the Relocated and host households was not good. Interviewees, however, have not highlighted specific issues that led to community tensions. They only report a lack of community cohesion and social attachments. This is often described in comparative terms, by contrasting their social relations on Sagar Island to those on Lohachara Island or Ghoramara Island. However, in time, the host communities started to help by offering Relocated households temporary accommodation, food, and work opportunities. Rajesh, a 54-year-old man, recounts:

*“They [host households] gave us a place to stay. They gave us a room, like a cowshed. They emptied their cowshed for us to stay. While living there, we started to build our homes.”*

When arriving to Sagar Island, his family was given only a small plot of forested land. Whilst his family removed the trees and started building a dwelling, they needed a place to stay. Host households offered his family a place to stay. Despite having little themselves, host households offered their cowsheds as temporary accommodation for Relocated families. Pradeep, a 60-year-old man, explains that as soon as he and his family arrived on Sagar Island, they needed

to find a source of income and subsistence, as post Planned Relocation support was not offered by the government. Pradeep explains how the host community was instrumental in this:

*“We worked in their [host households’] houses, [doing work] like cow rearing, cutting grasses [...]. They gave us food in the morning and afternoon, and [...] in the evening, they gave 100 rupees.”*

He explains how host households gave Relocated individuals daily labour in exchange for food and 100 rupees daily pay. This offered Relocated households a level of economic and food security. Furthermore, this initial community support seems to have been key in the integration of Relocated and host communities. Relocated interviewees report that, in time, they developed social attachments on Sagar Island and started to feel that they were part of the community.

Relocated respondents, however, appear to have dual social attachments, with Lohachara Island or Ghoramara Island and Sagar Island. For example, Kaia, a 70-year-old woman, says:

*“... still, I feel that we have left a golden place and come here.”*

Despite the repercussions of the environmental risks that people faced when living on Ghoramara Island, which Kaia acknowledges throughout her interview, she continues to refer to Ghoramara Island as a ‘golden place’. In comparing her life before and after the Planned Relocation, she repetitively expresses her desire to return to the life she used to have on Ghoramara Island. However, in these comparisons, Kaia does not refer to the time before the Planned Relocation but to the distant past, when her family had large plots of land and practiced subsistence agriculture. This is a common finding: Relocated interviewees that express a preference for their lives before the Planned Relocation refer to a time in the distant past, before their lives were affected by environmental risks. Some respondents also explain that they continue to visit Ghoramara Island and maintain relationships with people still living there. They visit each other for certain religious celebrations and attend each other’s weddings or funerals.

Differences in societal structures are mentioned in relation to uneven outcomes of the Planned Relocation. Relocated respondents describe that the Planned Relocation took place in stages, with those most in need being relocated first. They also had the advantage of electing a community representative to liaise with the Panchayat (the village council) in choosing the location for the new settlement on Sagar Island. Respondents, however, speak of preferential treatment associated with political affiliation throughout the Planned Relocation process. Some report that those supporting the Panchayat in power at that time were given access to bigger plots of land in locations on Sagar Island that were less exposed to coastal erosion. However, the perceived discrimination does not translate into community tensions. Relocated respondents speak of these differentiated societal structures in relation to political corruption and place the responsibility on the Panchayat and not the community members.

#### **4.2.3 Wellbeing before and after the Adaptation In-Situ**

##### **a) Material wellbeing**

Overall, respondents report that the Adaptation In-Situ had a marginal effect on material aspects. An assessment of wealth indicators does not demonstrate neither a significant amelioration nor deterioration of material circumstances (Figure 4.4). Whilst 62% of the Adapted In-situ respondents report living in the same dwelling they lived in a year before the embankment was built, 38% had to change dwelling due to the construction of the embankment.

The construction of the embankment affected the dwelling tenure of only one respondent, which went from renting to squatting. Those that changed dwellings were, however, able to own the new dwelling.



## The Material Wellbeing of the Adapted In-Situ sub-population

### Dwelling tenure



	Past	Present
Owning	93%	93%
Renting	3%	1%
Squatting	4%	6%

### Dwelling size



	Past	Present
Median	2.00 Kattha	2.00 Kattha

### Land size



	Past	Present
Median	2.00 Bigha	0.00 Bigha

### Roofing



	Past	Present
Stone/ brick/ slate	18%	30%
Cement/ tiles/ asbestos	38%	54%
Plastic/ polythene	3%	1%
Hay/ branches/ jute bags	41%	16%

### Drinking water source



	Past	Present
Piped water	0%	10%
Tubewell/ borehole	100%	90%

### Sanitation



	Past	Present
Flushing toilet	1%	3%
Pit latrine	54%	65%
No facility	16%	3%
Temporary	30%	31%

### Livelihoods



	Past			Present		
Crop farmer	I 6%			I 9%	II 3%	III 3%
Livestock farmer		II 3%				III 1%
Fish/ shrimp farmer				I 4%	II 3%	
Fishing	I 47%	II 25%		I 16%	II 16%	III 1%
Construction worker		II 3%		I 1%		
Domestic employee	I 3%	II 3%		I 1%	II 1%	
Transporter worker	I 9%			I 4%		
Daily labourer	I 22%	II 22%	III 6%	I 7%	II 10%	III 6%
Unemployed				I 11%		
Housewife	I 3%			I 41%		

Figure 4.4. A comparison between past (indicated in black) and present (indicated in green) material wellbeing in the Adapted In-Situ sub-population.

As far as the dwelling size is concerned, this remained at a median of 2 Katthas<sup>4</sup> both when comparing past and present circumstances of all respondents, as well as when comparing past and present circumstances of those that had to change their dwelling due to the construction of the embankment. Small improvements in roofing, drinking water, and sanitation are reported (Figure 4.4). For example, whilst before the construction of the embankment 41% of respondents had hay roofing, at the time of the study only 16% have hay roofing. Currently, the majority having either stone (30%) or cement (54%) roofing (Figure 4.4). The reduced exposure to environmental risks allowed Adapted In-Situ households to improve their housing conditions.

Adapted In-Situ respondents, however, report a decrease in available land size from a median of 2 Bigha<sup>5</sup> to a median of 0 Bigha<sup>6</sup>. Whilst 92% of respondents report having had between 0.1 Bigha and 10 Bigha of farmland, today, 55% of respondents report having no farmland. Respondents explain that they had to give away their land and dwellings to make space for the new embankment. In exchange for the land and dwelling, they received uneven compensations, with some receiving large sums of money whilst most receiving compensations lower than the market value of their land. Some report not receiving any compensation as they did not have the necessary paperwork to demonstrate the ownership of their land and dwelling. Others report not being informed that there was a

---

<sup>4</sup> The median is reported. Dwelling size past data (all respondents) is not normally distributed: skewness = 6.05 (standard error = .287); kurtosis = 8.63 (standard error = .566); Shapiro-Wilk's test ( $p < .05$ ). Dwelling size present data (all respondents) is not normally distributed: skewness = 5.23 (standard error = .293); kurtosis = 6.24 (standard error = .578); Shapiro-Wilk's test ( $p < .05$ ). Dwelling size past data (only respondents that changed dwelling due to the construction of the embankment) is not normally distributed: visual inspection of Normal Q-Q Plots and Shapiro-Wilk's test ( $p < .05$ ), even though a normal skewness = 1.46 (standard error = .448) and kurtosis = -.94 (standard error = .872). Dwelling size present data (only respondents that changed dwelling due to the construction of the embankment) is not normally distributed: visual inspection of Normal Q-Q Plots and Shapiro-Wilk's test ( $p < .05$ ), even though a normal skewness = 0.76 (standard error = .472) and kurtosis = -1.67 (standard error = .918).

<sup>5</sup> The median is reported. Land size past data is not normally distributed: skewness = 7.09 (standard error = .378); kurtosis = 10.96 (standard error = .741); Shapiro-Wilk's test ( $p < .05$ )

<sup>6</sup> The median is reported. Land size present data is not normally distributed: skewness = 18.10 (standard error = .285); kurtosis = 50.65 (standard error = .563); Shapiro-Wilk's test ( $p < .05$ )

deadline for the compensation cheques to be withdrawn, therefore losing the money.

This left many in a situation where whilst they were able to use the compensation to build a new dwelling, the money was not enough for them to buy new farmland. With Sagar Island also exposed to coastal erosion, available land is limited and expensive. However, the results on livelihoods show an increase in crop farming, from 6% in the past to 14% at the time of the study. This is because the embankment offers protection from coastal erosion and flooding, ensuring that crops are not gradually washed away. Bhuv, a 45-year-old Adapted In-Situ interviewee, explains the impact of the construction of the embankment:

*“People got help. In those lands where there was no cultivation, now it is happening. It has become fertile, ready for use. After the rupture of the embankment, at one time this place was not habitable. The usable water turned saline. Useless. Then after this embankment, people are getting fresh, sweet water.”*

Bhuv recounts the diverse ways in which the embankment contributes to the improvement of his material conditions. He refers to the Adaptation In-Situ as ‘help’ and describes the positive effects of this government intervention. Bhuv explains that the inhabitants of the coastal area of Beguakhali are now able to cultivate their land as ‘it has become fertile’. Similarly to Bhuv, other interviewees also explain that lands were regularly flooded and crops were washed away before the construction of the embankment. Furthermore, he describes an improvement in drinking water sources. Whilst the quantitative results have shown that Adapted In-Situ respondents were able to access drinking water sources, the analysis of the qualitative data sheds light on the fact that due to the regular flooding the tubewells became saline. Bhuv describes this transition from ‘saline’ to ‘fresh sweet water’.

Among those living on the coastal areas of Beguakhali who had to move because of the construction of the embankment, 70% had hay roofs compared to now 41% stone and 56% cement roofs, showing a significant improvement (Figure 4.4). Similarly, the sanitation conditions changed from 16% of respondents having no

facility in the past compared to only 3% having no facility at the time of the study. When looking at the results of those that had to move due to the construction of the embankment, 33% did not have any form of sanitary facilities, whilst 100% of respondents did at the time of the study (Figure 4.4).

## **b) Subjective wellbeing**

Overall, the Adaptation In-Situ does not seem to have affected respondents' life satisfaction neither positively nor negatively. Happiness and satisfaction with housing conditions are the only two subjective wellbeing aspects that significantly improved. The Adaptation In-Situ elicited an increase in happiness in 52% of respondents and a decrease in 17%, whereas 31% saw no difference (Figure 4.5). A lack of happiness is reported by respondents who have had a negative experience as far as the compensation process is concerned. Participants describe the compensation process as uneven, with some receiving disproportionate amounts of money because of their political affiliation whilst others receiving little or no compensation.

The Adaptation In-Situ elicited an increase in satisfaction with housing conditions in 56% of participants and a decrease in 21%, whereas 23% saw no difference (Figure 4.5). The protection against coastal erosion offered by the embankment led to these increased levels of satisfaction. There is a statistically significant median increase in satisfaction with housing before the Adaptation In-Situ (2 moderately unsatisfied) compared to after the Adaptation In-Situ (4 moderately satisfied),  $z = -3.30$ ,  $p < .001$ . Those who had to change dwelling due to the construction of the embankment report, on average, a decreased level of satisfaction with housing conditions, even though the analysis of material circumstances demonstrates an improvement in housing conditions (roofing and

## The Subjective Wellbeing of the Adapted In-Situ sub-population

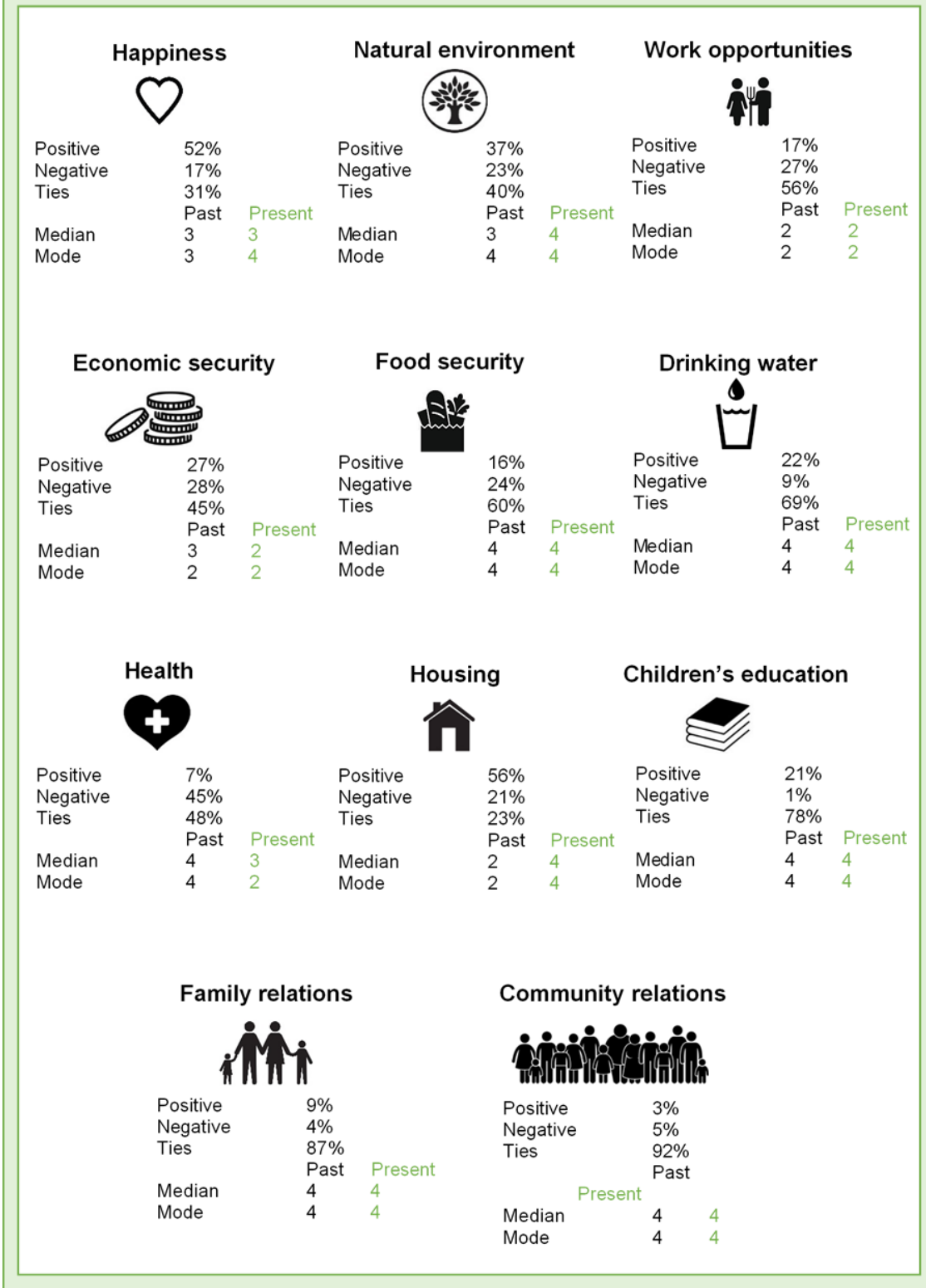


Figure 4.5. A comparison between past (indicated in black) and present (indicated in green) subjective wellbeing in the Adapted In-Situ sub-population.

sanitation) for those who changed dwelling as well as those who did not. Levels of satisfaction with the natural environment are mixed. 40% of respondents report the same level of satisfaction with the natural environment before and after the Adaptation In-Situ, whereas 37% report an improvement and 23% a decline (Figure 4.5). The statistical analysis does not reveal a statistically significant median increase in satisfaction with the natural environment from before the Adaptation In-Situ (3 neither unsatisfied nor satisfied), compared to the present day (4 moderately satisfied),  $z = 1.61$ ,  $p = 0.107$ . The mixed reporting on satisfaction with the natural environment is informed by perceptions of long-term protection offered by the embankment. Some interviewees perceive the embankment as effective in protecting them from coastal erosion, while others believe it will not last in the long term. When asked about how he sees his future in Beguakhali, Binay, a 54-year-old male, responds:

*“Our land will again be eaten up by the river.”*

He explains that the embankment is protecting the village from coastal erosion at the time of this study, but that he does not believe in the longevity of the solution. He believes that the embankment will eventually fail and his land will once again ‘be eaten up by the river’. The construction of the embankment, however, is not believed to have significantly affected other aspects of life satisfaction. Adapted In-Situ respondents report maintaining the same levels of satisfaction as far as work opportunities (56% ties), economic security (45% ties), drinking water (69% ties), children’s education (78% ties), family relations (87% ties), and community relations (92% ties) are concerned (Figure 4.5).

The Adaptation In-Situ, however, did elicit an improvement in satisfaction with drinking water (23%) and children’s education (21%) (Figure 4.5). Adapted In-Situ respondents report that the embankment protected the tubewells, preventing the contamination of fresh water. These results are consistent with the findings presented in relation to material wellbeing. Also, the protection offered by the embankment means that fewer investments are necessary to maintain their dwellings. Therefore, disposable income is available to invest in children’s education. The situation is different for those who had to give away their land to

make space for the construction of the embankment. Their disposable income is less, as they cannot rely on crop production. Shouvik, a 40-year-old man from Beguakhali, points out:

*“In my house it is all bought and eaten. How will I educate my son in high standards. How?”*

Shouvik explains that he has to purchase the food necessary for his household. This issue is commonly raised by Adapted In-Situ respondents who had lost their agricultural lands. The inability to practice subsistence agriculture or, at a minimum, have a yearly rice crop means that they rely on income to secure food. In such circumstances, Shouvik explains that there is little disposable income left, so he cannot educate his son.

Adapted In-Situ individuals report feeling moderately satisfied (median 4) with family and community relations before and after the construction of the embankment. Despite differences in compensation, with some receiving higher and others smaller payments, this issue does not lead to community tensions. Interviewees express dissatisfaction with government officials and do not fault the households that received preferential treatment. Satisfaction with health is the only subjective wellbeing aspect that decreased for 45% of respondents (Figure 4.5). Similarly to results on health satisfaction of Relocated respondents, this result is due the ageing process, more so than impacts on health associated with the consequences of the construction of the embankment.

### **c) Relational wellbeing**

Relational wellbeing emerges as a particularly important wellbeing aspect for the Adapted In-Situ sub-population. Respondents from Beguakhali report having strong community relations and being able to rely on practical support from one another. Shouvik, a 40-year-old male, explains:

*“The bond that we share with our neighbours [is good], there is a lot of friendship over here [in Beguakhali]. We all visit each other’s place, everyone*

*visits, everyone eats, if someone is in distress, then to cater to that person, or if someone is not at home or nobody is at home, and they are facing some problem, then that person is taken to the doctor. [...] We have this.”*

He describes the relationships between community members in terms of having a ‘bond’ and a ‘friendship’. He also speaks of communal living, explaining that ‘everyone visits’ one another and ‘everyone eats’ together. Adapted In-Situ interviewees explain that there are no tensions between Hindu and Muslim households. Typically, members of both religions would gather around the table and eat together as a way of socialising and celebrating important occasions. Difficulties that arose in terms of economic and food security affected the ability to socialise in this traditional way. However, as seen in the subjective wellbeing section, most respondents perceive their family and community relations as strong both before and after the Adaptation In-Situ. Shouvik describes the practical support and reliance that community members offer each other. He explains that if someone was to fall ill whilst their family members were not at home, neighbours would intervene and take care of the person in need. Furthermore, he speaks of concerns about future environmental risks at a community level. He says:

*“Suppose it can be seen that I have 1 Bigha land in the interior, I will go there. But what about those who do not have?”*

Shouvik hypothesises that if Beguakhali were to be exposed to environmental risks in the future, and if he were to have 1 Bigha of land ‘in the interior’, he could move there. However, he expresses worry about what would happen to those that do not have somewhere else to go. This worry for the communal wellbeing of the village demonstrates how respondents make sense of their lives in relational terms.

These relational aspects of wellbeing remained strong throughout the years, with little difference between the pre and post Adaptation In-Situ. Some interviewees reflect however on how differences in societal structures led to uneven outcomes as far as the Adaptation In-Situ is concerned. Respondents report having been given uneven compensations, with some receiving large sums of money while



others receiving compensations lower than the market value of their land. They claim that those in support of the political party in power received larger sums of money than they were due. Those who did not support the political party nor have a good relationship with the Panchayat (local village council) received lower compensation. However, these issues surrounding compensation do not translate in issues between community members. Adapted In-Situ respondents report that these issues have not affected their community relations. Hazra, a 68-year-old male, explains his feelings in relationship to these diverse societal structures:

*“[Everything is] good with us, no envy or anything. We are like brothers.”*

He explains that the differentiated outcomes of the Adaptation In-Situ do not affect community relations. He believes that the situation does not cause ‘envy’ among community members, instead, they maintain strong positive bonds. He describes community members’ relations as being ‘like brothers’. Overall, the Adapted In-Situ community reports high levels of cohesion and strong social networks, despite differentiated societal structures.

#### **4.2.4 Wellbeing before and after the Lack of Adaptation**

##### **a) Material wellbeing**

Overall, Non-Adapted respondents report some amelioration and some deterioration of material circumstances. Whilst 46% of the Non-Adapted respondents report living in the same dwelling they lived in ten years ago, 54% had to change dwelling due to the increased environmental degradation and coastal erosion. However, this did not affect the dwelling tenure of the respondents still living in Dhablat, neither of those that did nor of those that did not change their dwelling in the past ten years. 96% of overall Non-Adapted respondents currently own their dwelling compared to 94% in the past (Figure 4.6).

## The Material Wellbeing of the Non-Adapted sub-population

### Dwelling tenure



	Past	Present
Owning	94%	96%
Renting	3%	3%
Squatting	3%	1%

### Dwelling size



	Past	Present
Median	1.00 Kattha	1.00 Kattha

### Land size



	Past	Present
Median	8.00 Bigha	0.00 Bigha

### Roofing



	Past	Present
Stone/ brick/ slate	30%	39%
Cement/ tiles/ asbestos	26%	59%
Plastic/ polythene	1%	0%
Hay/ branches/ jute bags	43%	3%

### Drinking water source



	Past	Present
Tubewell/ borehole	100%	100%

### Sanitation



	Past	Present
Pit latrine	44%	74%
No facility	39%	7%
Temporary	17%	19%

### Livelihoods



	Past		Present		
Crop farmer	I 89%		I 7%	II 1%	
Livestock farmer				II 1%	
Fish/ shrimp farmer			I 3%		
Fishing	I 7%	II 1%	I 10%	II 10%	
Construction worker			I 1%		
Domestic employee				II 3%	
Transporter worker	I 1%				
Daily labourer	I 3%	II 3%	I 13%	II 11%	III 3%
Unemployed			I 7%		
Housewife			I 42%		

Figure 4.6. A comparison between past (indicated in black) and present (indicated in orange) material wellbeing in the Non-Adapted sub-population.

As far as the dwelling size is concerned, this remained at a median of 1 Kattha<sup>7</sup> when comparing past and present circumstances. The dwelling conditions improved in terms of roofing and sanitation. As far as roofing is concerned, this improved from 43% of roofs made of hay ten years ago to 3% at the time of the study (Figure 4.6). The majority of respondents that report having lived in the area of Dhablat that is currently submerged had roofs made out of hay (76%). Regarding sanitation, Non-Adapted respondents report an improvement from 39% lacking access to sanitation facilities ten years ago to 7% at the time of the study (Figure 4.6). For those that had to change dwellings, the improvement in sanitation conditions is even greater, with 68% having no access to sanitation facilities in the past to 11% at the time of the study. Overall, Non-Adapted respondents have been able to improve their housing conditions.

The greatest negative repercussion attributed to the Lack of Adaptation is the loss of farmland and traditional livelihoods. In the past, 100% of respondents report having had land, with 87% having between 2 and 25 Bighas of land. Today, 56% of Non-Adapted respondents have no land, with 40% of the remaining respondents having up to 3 Bighas of land. Overall, a median decrease from 8 Bighas<sup>8</sup> to 0 Bighas<sup>9</sup> of land is reported (Figure 4.6). Shakana, a 60-year-old woman from Dhablat, describes her family land in the past:

*“It was a beautiful fertile place.”*

Like Shakana, interviewees speak about Dhablat in terms of its fertile lands. The amount of farmland available and its quality allowed for the practice of

---

<sup>7</sup> The median is reported. Dwelling size past data is not normally distributed with: skewness = 2.68 (standard error = .287); kurtosis = 0.15 (standard error = .566); Shapiro-Wilk's test ( $p < .05$ ). Dwelling size present data is not normally distributed: visual inspection of Normal Q-Q Plots; Shapiro-Wilk's test ( $p < .05$ ); even though a normally distributed skewness = 2.53 (standard error = .289) and kurtosis = - 0.22 (standard error = .570)

<sup>8</sup> The median is reported. Land size past data is not normally distributed with: skewness = 4.50 (standard error = .304); kurtosis = 2.72 (standard error = .599); Shapiro-Wilk's test ( $p < .05$ )

<sup>9</sup> The median is reported. Land size present data is not normally distributed: skewness = 8.30 (standard error = .287); kurtosis = 12.34 (standard error = .566); Shapiro-Wilk's test ( $p < .05$ )

subsistence agriculture which led to a good standard of living. The degradation and loss of agricultural land led to a decrease in living standards and food security. Amar, a 46-year-old man, describes the current circumstances:

*“Now all that land [has eroded and] is not there [in Dhablat] in the present. Everything has been destroyed and whatever is left it cannot be cultivated. That is destroyed due to salinization.”*

Amar describes the situation of the coastal inhabitants of Dhablat as far as farmland is concerned. Most of the agricultural land between the village's main road and the sea has eroded. What remains is subject to salinity intrusion and, therefore, cannot be used for crop cultivation. The loss of land led to a drastic change in livelihoods, from 89% of respondents using crop farming as their primary livelihood ten years ago to only 8% of respondents using crop farming as their primary or secondary livelihood at the time of the study. An increase in reliance on daily labour is seen, as only 6% report relying on daily labour work as their primary or secondary livelihood ten years ago, compared to 27% that report relying on daily labour as their first, second, or third livelihood stream at the time of the study (Figure 4.6). Furthermore, 7% report being unemployed at the time of this study.

## **b) Subjective wellbeing**

Non-Adapted respondents report a statistically significant median decrease in subjective wellbeing as far as happiness is concerned, from the past (4 moderately satisfied), compared to the present day (2 moderately unsatisfied),  $z = - 5.31, p < .001$  (Figure 4.7). As far as aspects of life satisfaction, a statistically significant median decrease in satisfaction with natural environment ( $z = - 4.81, p < .001$ ), work opportunities ( $z = - 6.44, p < .001$ ), economic security ( $z = - 5.74, p < .001$ ), food security ( $z = - 5.16, p < .001$ ), and health ( $z = - 5.409, p < .001$ ) was reported (Figure 4.7).

## The Subjective Wellbeing of the Non-Adapted sub-population

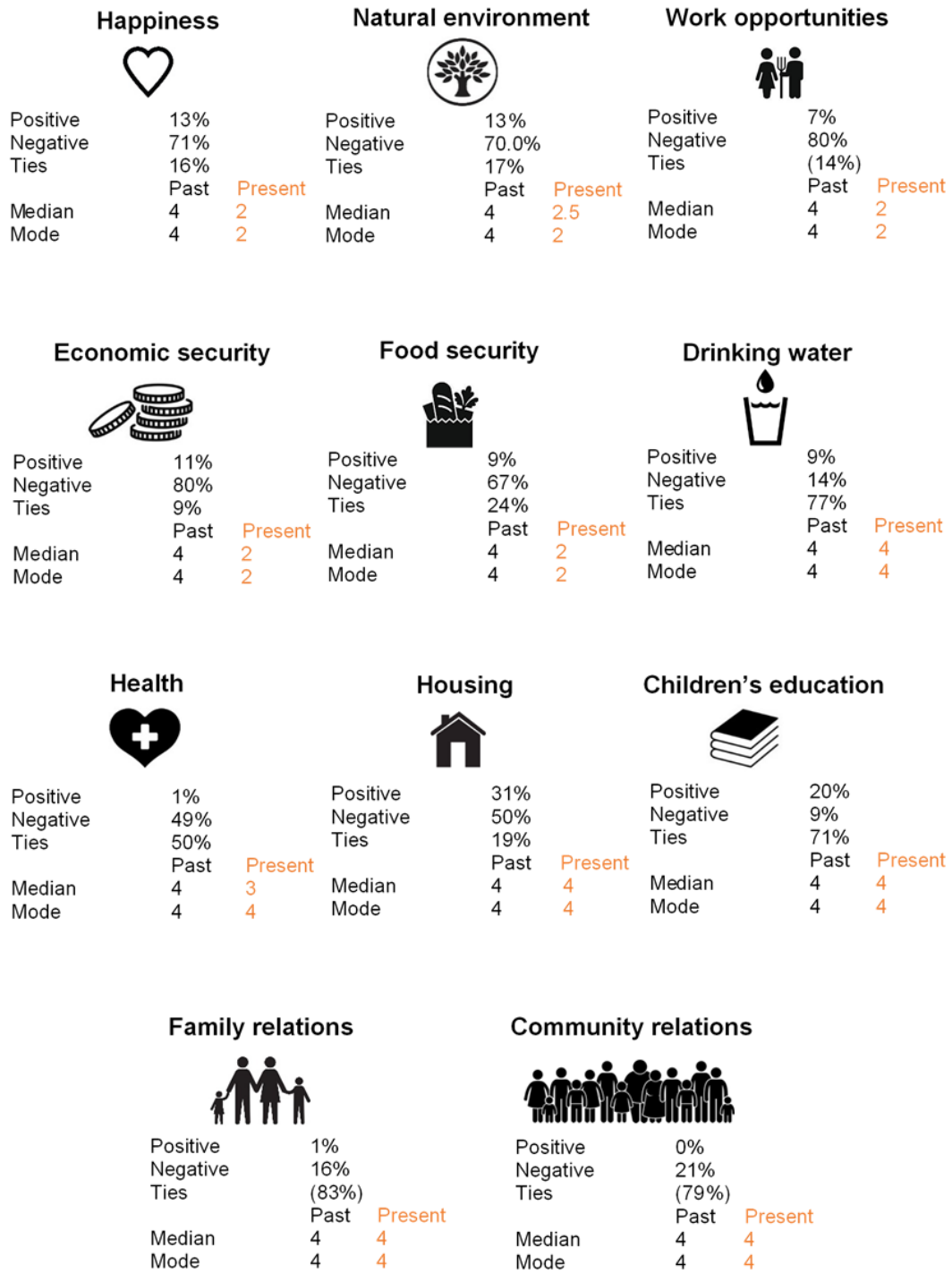


Figure 4.7. A comparison between past (indicated in black) and present (indicated in orange) subjective wellbeing in the Non-Adapted sub-population.

Non-Adapted respondents speak of satisfaction with the natural environment in terms of the impacts of environmental risks and degradation on agricultural land. These accounts bring together concerns related to work opportunities, economic security, and food security. For example, Taara, a 52-year-old woman from Dhablat, says:

*“If we do not cultivate, we cannot eat.”*

She describes the relationship between subsistence agriculture and food security clearly. Throughout the interview, she explains that historically her family relied on subsistence agriculture. However, due to continued exposure to environmental risks, they lost their land and thus the ability to cultivate crops. She clearly states that if they cannot cultivate, they cannot eat. Taara also explains that her family is experiencing economic and food insecurity due to a lack of work opportunities. She sheds light on the importance of economic security in terms of increased adaptive capacity:

*“If we had money, we would have settled somewhere in the interior. We are sad because we do not have any agriculture now here. Many are buying land in the middle parts and are cultivating. They are also having sumptuous meals now.”*

Taara describes that the coastal inhabitants of Dhablat who have financial means and can purchase land in the inner areas of the village are better off than those unable to move. She refers to their circumstances in positive terms as far as agriculture ([they] are cultivating) and food security (they are also having sumptuous meals) are concerned. Taara reflects that she would prefer to relocate her family ‘somewhere in the interior’ but that she does not have the economic means of doing so. She expresses that her circumstances make her ‘sad’, demonstrating how happiness and life satisfaction factors interrelate.

Levels of satisfaction with housing conditions also appear to have decreased for 50% of the Non-Adapted respondents, but this has not led to a statistically significant result (Figure 4.7). Most respondents report being moderately satisfied (mode 4) with the housing conditions in both the past and present, whilst 31% report an improvement. This is consistent with the results presented in the section

on material wellbeing. However, Non-Adapted interviewees highlight the precariousness of their dwellings. Whilst housing conditions such as roofing and access to sanitation and drinking water do not appear to be a concern, the overall exposure of dwellings to increasingly severe environmental risks is a significant issue. When asked what the main problem that the village of Dhablat is facing is, Prasad, a 60-year-old male, says:

*“To say about main problem, houses are being destroyed, land have been submerged.”*

Similarly to Taara, he expresses concern with regard to the loss of agricultural lands. He also says that ‘houses are being destroyed’. Non-Adapted respondents speak at length about the precariousness of their dwellings due to exposure to environmental risks, lack of adaptive capacity, and lack of government support. These conditions, combined with the loss of agricultural land and lack of access to work opportunities, which influence economic and food security, are commonly raised as concerns by Non-Adapted respondents. Often, they speak about these complex circumstances in terms of feeling ‘trapped’. This is assessed as respondents often express their feelings about their current circumstances by saying things like: *“where will you go and what will you do”* or *“we do not have a place elsewhere where we can go and stay”* or *“this is all that we have”*.

The population living in Dhablat is highly marginalised and has limited capacity to adapt independently or resist government inaction. On the other hand, the government has no incentive to intervene. Those that still live there lack the ability to move if they wish to, in effect becoming a trapped population.

### **c) Relational wellbeing**

Respondents make sense of their circumstances often at a community level, highlighting how they see themselves as relational selves. When speaking of current concerns, Taara, a 52-year-old woman from Dhablat, says:

*“How to survive that is our major concern.”*

She describes the circumstances of Dhablat as so severe as to threaten the ability of its inhabitants to survive in place. Throughout her interview, Tara often speaks about the environmental circumstances that the inhabitants of Dhablat are facing and the subsequent impacts these bring. Whilst at times she distinguishes between her conditions and those of others that are better off economically and consequently more able to adapt, she mainly speaks about concerns at a community level.

Overall, Non-Adapted respondents do not speak about family and community relations in their accounts of their lives, neither in the past nor in the present. Instead, they speak at length about their material circumstances and overall concerns regarding adaptation and survival. When asked directly about their lives at home and within the community, respondents report that good relationships exist. Prasad, a 60-year-old male, says:

*“That is there, absolutely. This is the universal law.”*

He reports that the community living in Dhablat is able to maintain good relations. He explains throughout the interview that community relations are of particular importance to their culture and are considered a ‘universal law’. Similarly, Ray, a 42-year-old male, when describing the relations in his community, says:

*“All are peaceful.”*

Some interviewees reflect on how differences in societal structures lead to uneven outcomes as far as government action and inaction are concerned. Whilst the inhabitants of Lohachara Island and Ghoramara Island have been adapted through Planned Relocation, and the inhabitants of Beguakhali have been adapted through Adaptation In-Situ, the inhabitants of Dhablat, on the other hand, have not been adapted. Non-Adapted respondents speak of the lack of government incentive to intervene in Dhablat as opposed to political and economic motivations in relation to the Planned Relocation and Adaptation In-Situ, respectively. However, they report living harmoniously with the other communities of Sagar Island. The differentiated government intervention is not



seen as the responsibility of the villagers, and thus it does not lead to community tensions.

### **4.3 A comparison of wellbeing between Relocated, Adapted In-situ, and Non-Adapted sub-populations**

#### **4.3.1 A guidance on how to navigate the results sections on comparisons of wellbeing across sub-populations**

This section presents a comparison of wellbeing between Relocated, Adapted In-Situ, and Non-Adapted sub-populations at the present time. Similarly to the results presented in section 4.2, the results presented here are drawn from a combination of quantitative (surveys n=222) and qualitative (semi-structured interviews n=14) data analysis. The following sub-sections present the comparative analysis of material wellbeing (section 4.3.2), subjective wellbeing (section 4.3.3), and relational wellbeing (section 4.3.4).

Material wellbeing is assessed in terms of land availability and income. Similarly to other studies on material wellbeing in developing countries, the approach is to collect a heterogeneous set of indicators that, when taken together, make for a good proxy variable for living standards. Land availability is chosen as a material wellbeing variable of interest, as the analysis presented throughout section 4.2 demonstrates the importance of land availability for the three sub-populations of interest. This is due to their traditional reliance on subsistence agriculture. Considering the progressive loss of agricultural lands and the consequent shift from subsistence agriculture to income generation through diversification of livelihoods, income is also chosen as a material wellbeing variable of interest. Measures of frequency and central tendency (mean, median, or mode) are reported.

Subjective wellbeing is assessed in terms of happiness as well as ten life satisfaction domains. All subjective wellbeing variables are measured on a five-point Likert scale and are flagged as frequencies in Figures 4.8 to 4.18. Measures of frequency and central tendency (mode) as well as results of inferential

statistics (mean ranks) are reported. The inferential statistics are drawn from a series of Kruskal-Wallis H tests followed by Dunn's procedure with a Bonferroni correction for multiple comparisons. The changes in relational wellbeing are drawn from the thematic analysis of semi-structured interviews.

#### **4.3.2 Material wellbeing**

Traditionally, all three sub-populations used to rely on subsistence agriculture. Relocated, Adapted In-Situ, and Non-Adapted interviewees alike highlight the importance of farmland for their material wellbeing. The comparative analysis concludes that Relocated respondents are better off regarding the amount of farmland available. 71% of Relocated respondents have between 0.4 and 2.0 Bighas of land. Whilst, on average, this is less land than the Adapted In-Situ and Non-Adapted respondents report, only 29% of Relocated respondents report currently owning no farmland. In comparison, 55% and 56% of Adapted In-Situ and Non-Adapted respondents respectively report currently owning no farmland.

The Non-Adapted sub-population has progressively lost land, leaving 56% of the inhabitants of the coastal areas of Dhablat landless. Despite their circumstances, Non-Adapted respondents report not receiving neither new plots of farmland nor compensation for the land lost. Similarly, the inhabitants of the coastal area of Beguakhali have been exposed to gradual coastal erosion before the Adaptation In-Situ, which led to a loss of farmland. Subsequently, an additional loss of land was experienced due to the construction of the embankment. This led to 55% of Adapted In-Situ respondents being landless. Adapted In-Situ respondents, however, report that they received compensation for the farmland lost due to the construction of the embankment. The Relocated sub-population, whilst has not received compensation for the land lost on Lohachara Island and Ghoramara Island, has received new farmland as part of the Planned Relocation to Sagar Island. This led to a higher percentage of Relocated respondents being landowners compared to those Adapted In-Situ and Non-Adapted. All relocated households received a plot, with those relocated first receiving larger plots (up to

3 Bighas) and those relocated last receiving smaller plots (0.5 Bighas). The latter group, however, had to use the land to build their dwelling and pond, leaving them with no land for farming.

As far as income is concerned, the Adapted In-Situ respondents report the highest monthly income (5,782 rupees), followed by the Relocated respondents (4,785 rupees), and finally, the Non-Adapted respondents (4,605 rupees). Across the three sub-populations, the income is derived from a variety of livelihoods, with most respondents relying on two or three livelihood sources. Adapted In-Situ respondents report relying primarily on seasonal jobs (43%), followed by permanent jobs (15%), for their income. In comparison, 39% and 11% of Non-Adapted respondents report relying on seasonal and permanent jobs, respectively, and 22% and 11% of Relocated respondents report relying on seasonal and permanent jobs, respectively. The Relocated sub-population, however, compared to the other two, relies the most on short-term jobs, with 14% of Relocated respondents reporting earning as daily labourers.

In addition to the monthly incomes, households also report receiving remittances, with 64% of Non-Adapted, 53% of Relocated, and 42% of Adapted In-situ respondents reporting at least one family member having migrated in the past five years. Across the three sub-populations, those that migrate do so predominantly seasonally, with some often migrating for short periods. The lack of work opportunities combined with the reduced availability of farmland puts the inhabitants of Sagar Island in a position where they have to migrate to seek employment. 64% of Non-Adapted, 53% of Relocated, and 41% of Adapted In-Situ respondents flag seeking employment as the primary reason for migration. The secondary reason for migration across sub-populations is debt (37% Relocated, 26% Non-Adapted, and 10% Adapted In-Situ). The Non-Adapted are the only respondents that flag additional reasons for migration, such as loss of income one season, loss of income multiple seasons, environmental degradation, and environmental hazards.

Overall, as far as income is concerned, the Adapted In-Situ respondents have the highest monthly income deriving from secure types of employment (seasonal or

permanent jobs) and rely least on remittances. On the other side of the spectrum, the Non-Adapted respondents report the smallest incomes and the highest reliance on remittances. The Relocated respondents report being better off than the Non-Adapted, but worse off than the Adapted In-Situ both in terms of income and reliance on remittances.

In summary, the Adapted In-Situ sub-population has the highest average income per household. This is derived from stable income sources such as permanent and seasonal jobs. Adapted In-Situ respondents also report the lowest number of family members migrating for economic reasons and sending back remittances. The Relocated sub-population is better-off as far as farmland is concerned, with the least Relocated respondents reporting having no farmland. Their land, due to the positioning of their settlements, is also protected from coastal erosion and salinity intrusion. However, Relocated respondents are the least able to access permanent and seasonal jobs and rely mostly on daily labour wages. The Non-Adapted sub-population is the worse-off in terms of both income and land. The Non-Adapted respondents report the lowest monthly income on average, with the most family members sending remittances. They also report the least amount of available farmland, which they expect to continuously decrease due to coastal erosion.

#### **4.3.3 Subjective wellbeing**

Overall, the Relocated sub-population has the highest number of mean ranks in six out of eleven subjective wellbeing variables, followed by the Adapted In-Situ sub-population with the second highest number of mean ranks in four out of eleven subjective wellbeing variables, and the Non-Adapted sub-population with the highest mean rank in only one subjective wellbeing variable.

In terms of **happiness**, the Adapted In-Situ respondents report being the happiest at the time of this study, with 49% reporting to be moderately happy (Figure 4.8). Similarly, 40% of Relocated respondents report being moderately happy. The

mean ranks of 'happiness' increase from Non-Adapted (87), to Relocated (109), to Adapted In-Situ (120), with differences between all three sub-populations being statistically significantly different  $\chi^2(2) = 11.452, p = .003$  (Table 4.1).

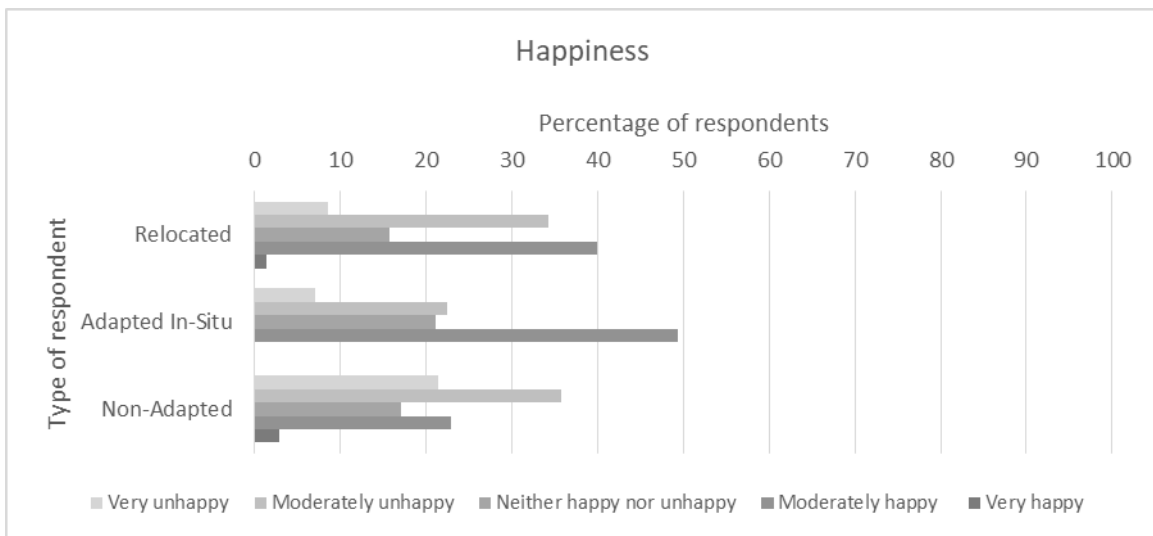


Figure 4.8. A comparison of 'Happiness' in Relocated, Adapted In-Situ, and Non-Adapted sub-populations

The Relocated respondents report the highest levels of **satisfaction with the natural environment**, with 93% of respondents being either moderately or very satisfied (Figure 4.9). Mean ranks of satisfaction with the natural environment increase from Non-Adapted (74), to Adapted In-Situ (104), to Relocated (138) (Table 4.1). The differences in scores between Relocated and Adapted In-Situ ( $p < .001$ ), and Relocated and Non-Adapted ( $p < .001$ ) (Table 4.1) are both statistically significantly different.

Dimension	Criteria	Population	Mean rank	Statistically significant differences between sub-populations	Pairwise comparisons	Statistically significant differences in mean ranks
Subjective wellbeing	Happiness	Relocated	109	YES: $\chi^2(2) = 11.452, p = .003$	Non-Adapted vs Relocated	NO ( $p = .080$ )
		Adapted In-Situ	120		Non-Adapted vs Adapted In-Situ	YES ( $p = .003$ )
		Non-Adapted	87		Relocated vs Adapted In-Situ	NO ( $p = .807$ )
	Satisfaction with the natural environment	Relocated	138	YES: $\chi^2(2) = 50.548, p < .001$	Non-Adapted vs Adapted In-Situ	YES ( $p < .001$ )
		Adapted In-Situ	104		Non-Adapted vs Relocated	YES ( $p < .0005$ )
		Non-Adapted	74		Adapted In-Situ vs Relocated	YES ( $p < .0005$ )
	Satisfaction with work opportunities	Relocated	130	YES: $\chi^2(2) = 27.148, p < .001$	Non-Adapted vs Adapted In-Situ	YES ( $p = .024$ )
		Adapted In-Situ	106		Non-Adapted vs Relocated	YES ( $p < .001$ )
		Non-Adapted	80		Adapted In-Situ vs Relocated	YES ( $p = .032$ )
	Satisfaction with economic security	Relocated	131	YES: $\chi^2(2) = 29.432, p < .001$	Non-Adapted vs Adapted In-Situ	YES ( $p = .011$ )
		Adapted In-Situ	107		Non-Adapted vs Relocated	YES ( $p < .001$ )
		Non-Adapted	79		Adapted In-Situ vs Relocated	YES ( $p = .034$ )
	Satisfaction with food security	Relocated	123	YES: $\chi^2(2) = 18.378, p < .001$	Non-Adapted vs Adapted In-Situ	YES ( $p = .012$ )
		Adapted In-Situ	110		Non-Adapted vs Relocated	YES ( $p < .001$ )
		Non-Adapted	83		Adapted In-Situ vs Relocated	NO ( $p = .563$ )
	Satisfaction with drinking water	Relocated	109	NO: $\chi^2(2) = 2.739, p = .254$	N/A	N/A
		Adapted In-Situ	110		N/A	N/A
		Non-Adapted	97		N/A	N/A
	Satisfaction with health	Relocated	109	NO: $\chi^2(2) = 4.132, p = .127$	N/A	N/A
		Adapted In-Situ	94		N/A	N/A
		Non-Adapted	113		N/A	N/A
	Satisfaction with housing	Relocated	128	YES: $\chi^2(2) = 24.813, p < .001$	Non-Adapted vs Adapted In-Situ	NO ( $p = .216$ )
		Adapted In-Situ	102		Non-Adapted vs Relocated	YES ( $p < .001$ )
		Non-Adapted	86		Adapted In-Situ vs Relocated	YES ( $p = .005$ )
Satisfaction with children's education	Relocated	110	NO: $\chi^2(2) = 2.173, p = .337$	N/A	N/A	
	Adapted In-Situ	108		N/A	N/A	
	Non-Adapted	98		N/A	N/A	
Satisfaction with family relations	Relocated	100	NO: $\chi^2(2) = 2.517, p = .284$	N/A	N/A	
	Adapted In-Situ	112		N/A	N/A	
	Non-Adapted	104		N/A	N/A	
Satisfaction with community relations	Relocated	98	YES: $\chi^2(2) = 8.692, p = .013$	Relocated vs Non-Adapted	NO ( $p = 1$ )	
	Adapted In-Situ	119		Relocated vs Adapted In-Situ	YES ( $p = .029$ )	
	Non-Adapted	99		Non-Adapted vs Adapted In-Situ	YES ( $p = .036$ )	

Table 4.1. Statistically significant differences in subjective wellbeing between Relocated, Adapted In-Situ, and Non-Adapted sub-populations

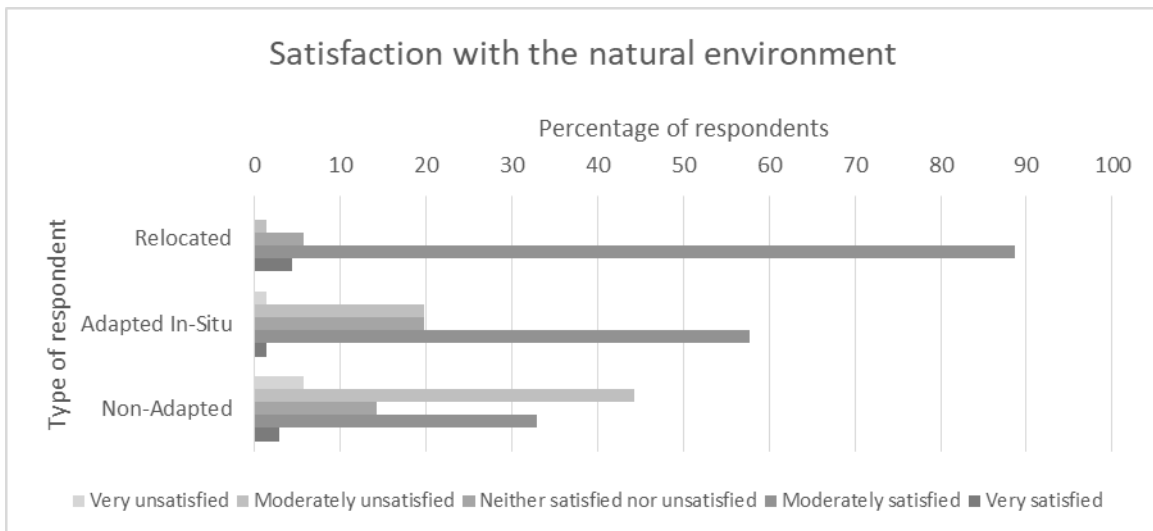


Figure 4.9. A comparison of 'Satisfaction with the natural environment' in Relocated, Adapted In-Situ, and Non-Adapted sub-populations.

The results of the semi-structured interviews shed light on these differences. Relocated respondents report that their settlements on Sagar Island are inland, making them the least exposed to environmental risks. Despite being protected by the embankment, Adapted In-Situ respondents report a lack of confidence in the embankment as a feasible long-term solution, leading to lower levels of satisfaction with the natural environment. The Non-Adapted respondents report being constantly exposed to environmental risks such as flooding and coastal erosion. This latter is the only sub-population with a mode of 2, meaning most respondents report being moderately unsatisfied with the natural environment (Figure 4.9).

Levels of **satisfaction with work opportunities** are highest among Relocated respondents, with a mean rank of (130), followed by Adapted In-Situ respondents (106), and Non-Adapted respondents (80), with all pairwise comparisons between populations being statistically significantly different  $\chi^2(2) = 27.148, p < .001$  (Table 4.1).

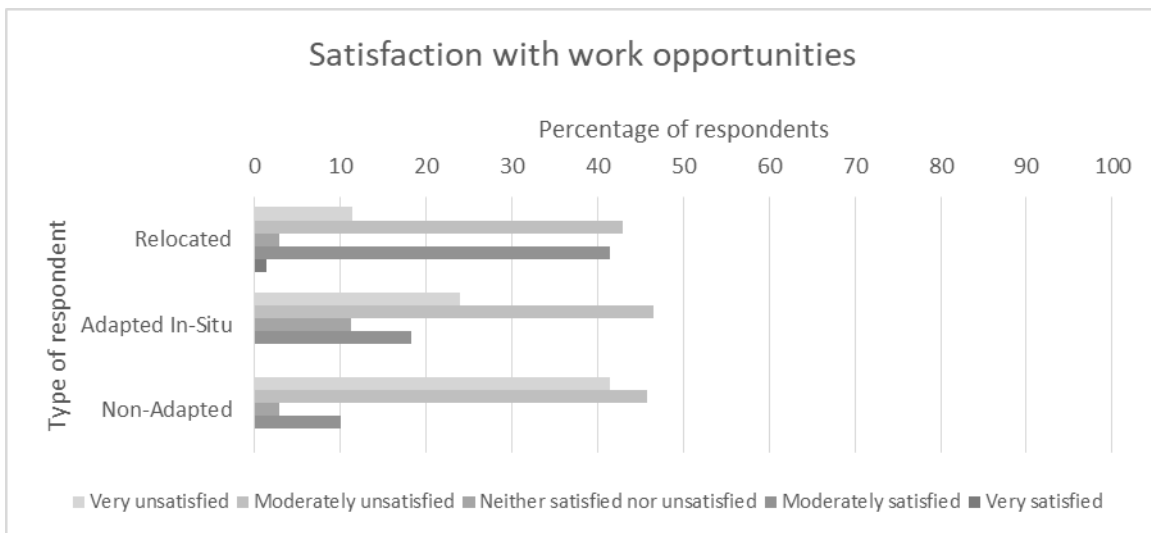


Figure 4.10. A comparison of 'Satisfaction with work opportunities' in Relocated, Adapted In-Situ, and Non-Adapted sub-populations.

44% of Relocated respondents report being either moderately or very satisfied with available work opportunities on Sagar Island, compared to 18% of Adapted In-Situ respondents and 10% Non-Adapted respondents being moderately satisfied (Figure 4.10). The majority of Non-Adapted respondents (97%) report being moderately or very dissatisfied. This difference may be due to the amount of farmland available. Those Relocated currently have more farmland (on average 0.77 Bigha) than those Non-Adapted (on average 0 Bigha), allowing them to practice subsistence agriculture or supplement their livelihoods. As reported in the previous sections, the ability to practice agriculture is seen as of utmost importance by all three types of respondents.

In section 4.3.2, results have shown that Non-Adapted respondents report relying on seasonal (39%) and permanent jobs (11%), whilst Relocated respondents report relying on seasonal jobs (22%) and daily labour (14%) with only 11% being able to access permanent jobs. Furthermore, as shown in section 4.3.2, Non-Adapted respondents report the lowest monthly income on average, with the highest number of family members sending remittances. These complex circumstances in terms of lack of agricultural land, low income, and reliance on remittances can potentially explain the Non-Adapted respondents' low levels of satisfaction with work opportunities.



In terms of **satisfaction with economic security**, there are statistically significant differences in pairwise comparisons between the mean ranks of all three populations. The mean ranks decreased from Relocated (131), to Adapted In-Situ (107), to Non-Adapted (79) (Table 4.1). Therefore, the Relocated respondents report statistically significantly higher levels of satisfaction with economic security compared to the other two sub-populations. Only 3% of Relocated respondents report being very unsatisfied, compared to 24% of Non-Adapted respondents (Figure 4.11). The Relocated, Adapted In-Situ, and Non-Adapted settlements are in close proximity, with populations reporting similar skill sets and abilities to access the few available working opportunities.

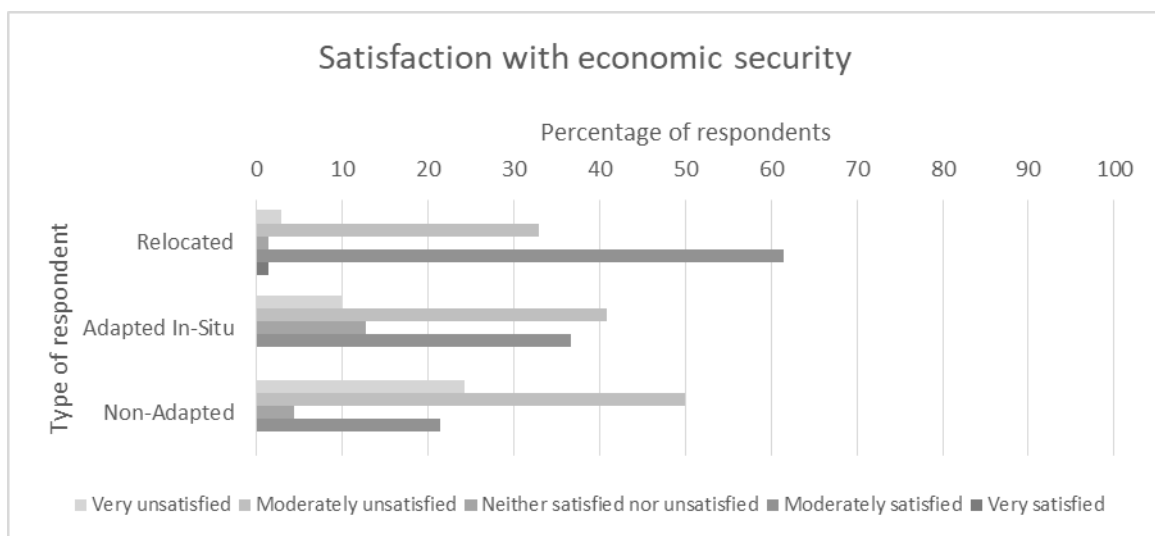


Figure 4.11. A comparison of 'Satisfaction with economic security' in Relocated, Adapted In-Situ, and Non-Adapted sub-populations.

However, those Non-Adapted need higher levels of income to support their families as they report to be unable to rely on agricultural production. Furthermore, they also report requiring more capital to invest in the upkeep of their dwellings due to the constant exposure to coastal erosion and flooding.

Levels of **satisfaction with food security** mirror the results on levels of satisfaction with economic security. Relocated respondents are the most satisfied, with 70% being either moderately or very satisfied, followed by 54% of Adapted In-Situ respondents, and 30% of Non-Adapted respondents (Figure 4.12). The Non-Adapted population is the only one with a mode of 2, meaning

most respondents feel moderately unsatisfied as far as food security is concerned.

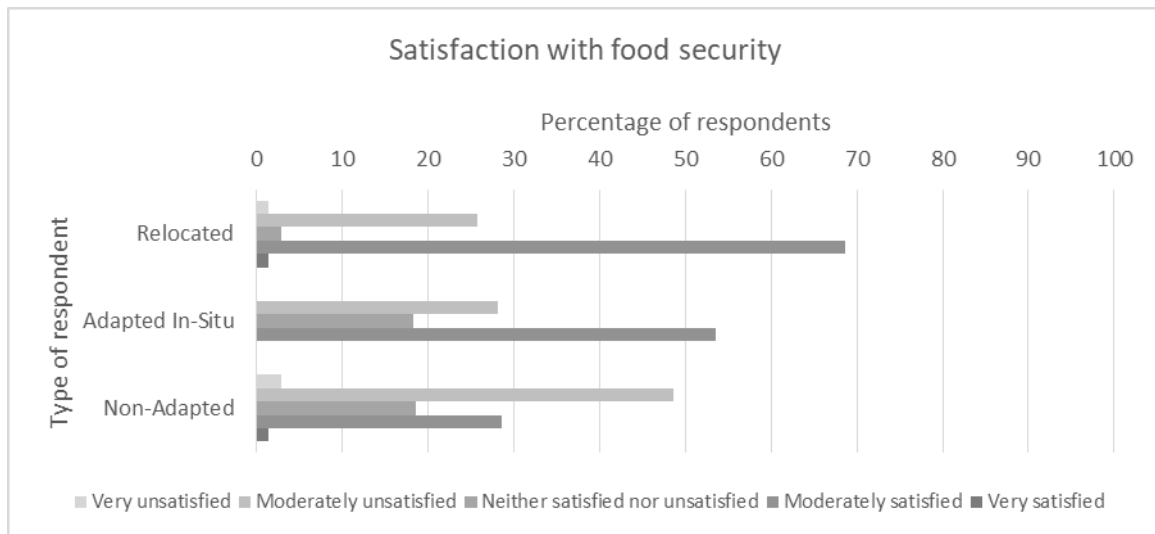


Figure 4.12. A comparison of 'Satisfaction with food security' in Relocated, Adapted In-Situ, and Non-Adapted sub-populations.

The results of the semi-structured interviews shed light on these differences. The availability of farmland is the key reason. As mentioned above, the Relocated population was given farmland as part of the Planned Relocation. Whilst Relocated respondents report that the land they were given is not enough to cover the needs of a household entirely, it is nonetheless a good source of food. They report that because of the position of their settlement, their farmlands are not exposed to salinity intrusion. The Relocated respondents that arrived on Sagar Island in the early stages of the Planned Relocation and received up to 3 Bighas of land report the highest levels of satisfaction with food security. They report being able to produce enough rice to feed their household year around. The Non-Adapted interviewees explain that being able to farm is vital. In their case, with little farmland, few work opportunities, and low incomes, it is reportedly difficult to maintain a satisfactory level of food security.

Respondents' **satisfaction with drinking water** was high in all three sub-populations. 97% of Relocated respondents, 86% of Non-Adapted respondents, and 80% of Adapted In-Situ respondents report being moderately or very satisfied (Figure 4.13). All three types of interviewees report having access to clean drinking water sources.

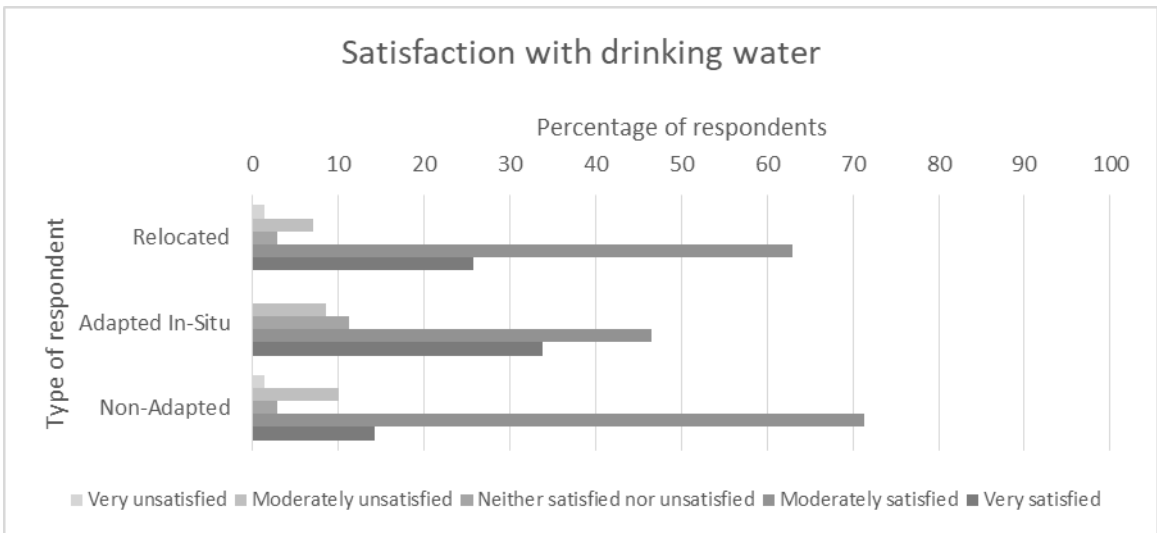


Figure 4.13. A comparison of 'Satisfaction with drinking water' in Relocated, Adapted In-Situ, and Non-Adapted sub-populations.

Respondents have mixed opinions with regard to **satisfaction with health**. Relocated respondents report being either moderately satisfied (50%) or moderately unsatisfied (40%) (Figure 4.14). Adapted In-Situ respondents report being either moderately satisfied (30%) or moderately unsatisfied (48%) (Figure 4.14).

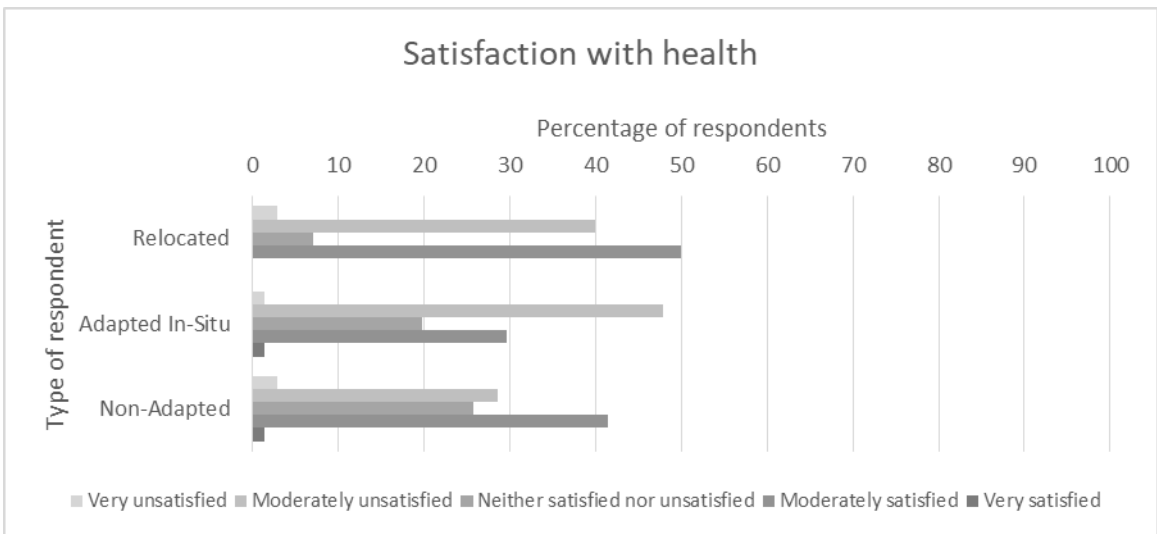


Figure 4.14. A comparison of 'Satisfaction with health' in Relocated, Adapted In-Situ, and Non-Adapted sub-populations.

Non-Adapted respondents report being either moderately satisfied (41%) or moderately unsatisfied (28%). As already discussed in section 4.3.2, results in relation to health are not necessarily representative of government action or inaction impacts on wellbeing.

The mean ranks of **satisfaction with housing** increased from Non-Adapted (86), to Adapted In-Situ (102), to Relocated (128), with differences between populations being statistically significantly different,  $\chi^2(2) = 24.813$ ,  $p < .001$  (Table 4.1). The levels of satisfaction with housing in Relocated respondents are statistically significantly higher between both Relocated and Adapted In-Situ ( $p = .005$ ), and Relocated and Non-Adapted ( $p < .001$ ) (Table 4.1). The qualitative analysis of the semi-structured interviews sheds light on this result. Relocated interviewees appear to assess their current circumstances by knowingly or unknowingly comparing them to their circumstances before the Planned Relocation, and the circumstances of the people still living on Ghoramara Island. This leads to a positive assessment of current circumstances.

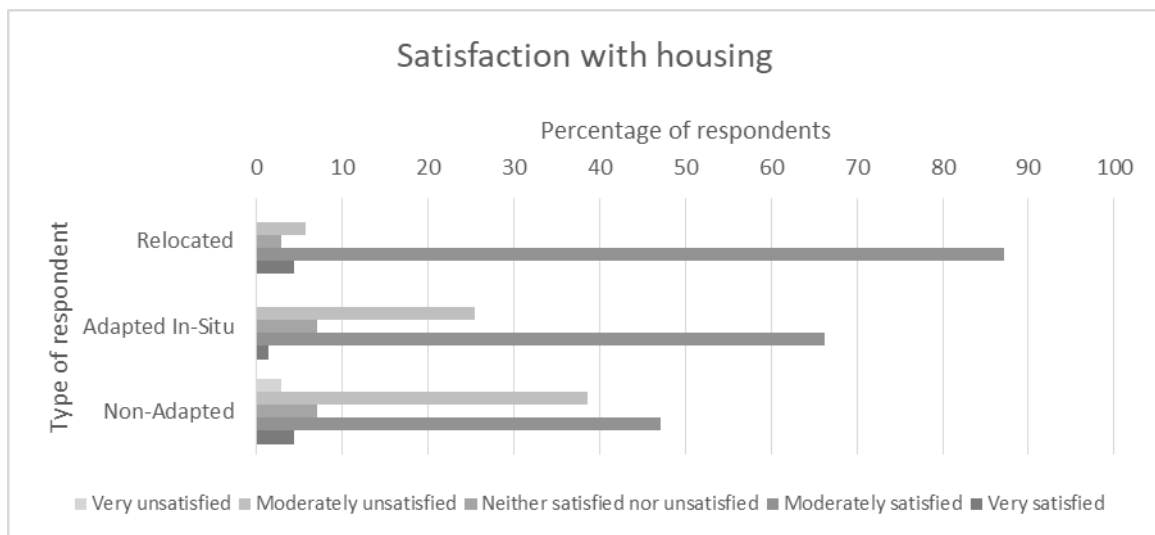


Figure 4.15. A comparison of 'Satisfaction with housing' in Relocated, Adapted In-Situ, and Non-Adapted sub-populations.

Similarly, Adapted In-Situ interviewees compare their housing conditions to conditions before the construction of the embankment. Consequently, 92% of Relocated and 68% of Adapted In-Situ respondents report being moderately or very satisfied (Figure 4.15). The Non-Adapted respondents have mixed opinions, with 42% being moderately or very unsatisfied and 52% being moderately or very satisfied.

All three populations report high levels of **satisfaction with children's education**. The mean ranks increased from Non-Adapted (98), to Adapted In-Situ (108), to Relocated (110), with differences between populations not being

statistically significantly different,  $\chi^2(2) = 2.173, p = .337$  (Table 4.1). Interviewees from all three sub-populations explain the importance of education. Having to transition from subsistence agriculture to employment, Relocated, Adapted In-Situ, and Non-Adapted respondents alike put a lot of value on education. They discuss children’s education as necessary for skill development and livelihood diversification.

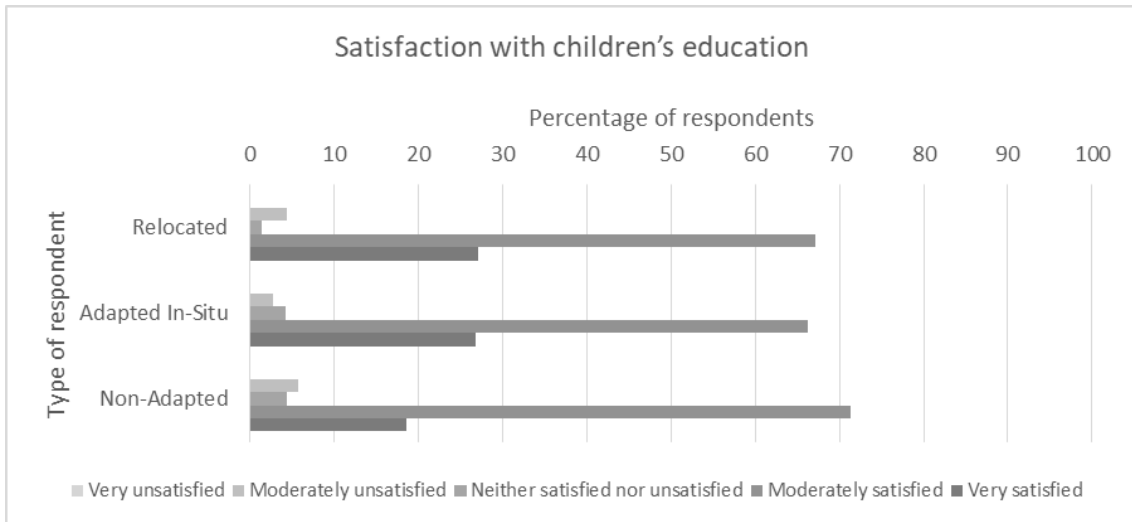


Figure 4.16. A comparison of ‘Satisfaction with children’s education’ in Relocated, Adapted In-Situ, and Non-Adapted sub-populations.

Levels of **satisfaction with family relations** and **satisfaction with community relations** are high in all three sub-populations. The mode for all populations in terms of both family and community relations is 4 (moderately satisfied). Interviewees explain how living in harmony and relying on community support is key for communal living and something that Relocated, Adapted In-Situ, and Non-Adapted respondents value. Slightly higher levels of satisfaction are reported by the Adapted In-Situ respondents, with 31% and 35% being very satisfied with family and community relations, respectively (Figure 4.17 and 4.18). This is due to the fact that the construction of the embankment allowed the inhabitants of Beguakhali to remain and live in the same community. Those that changed dwellings due to the construction of the embankment remained in close proximity to where their original dwelling was located, thus remaining part of the same community. Inferential statistics results show statistically significant differences between Adapted In-Situ and Relocated ( $p = .029$ ), and between Adapted In-Situ

and Non-Adapted ( $p = .036$ ), as far as community relations are concerned (Table 4.1).

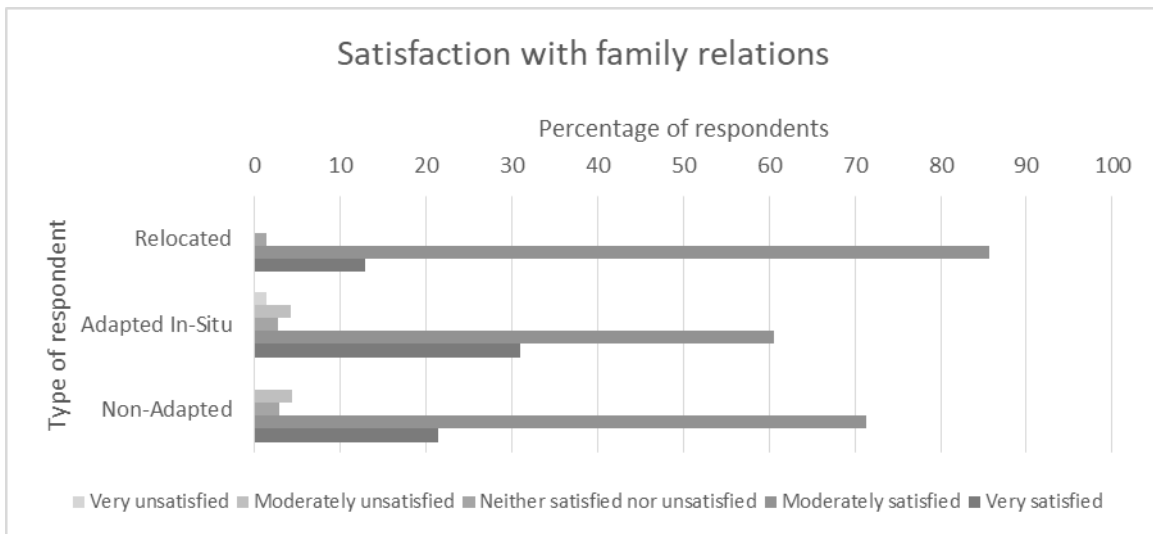


Figure 4.17. A comparison of 'Satisfaction with family relations' in Relocated, Adapted In-Situ, and Non-Adapted sub-populations.

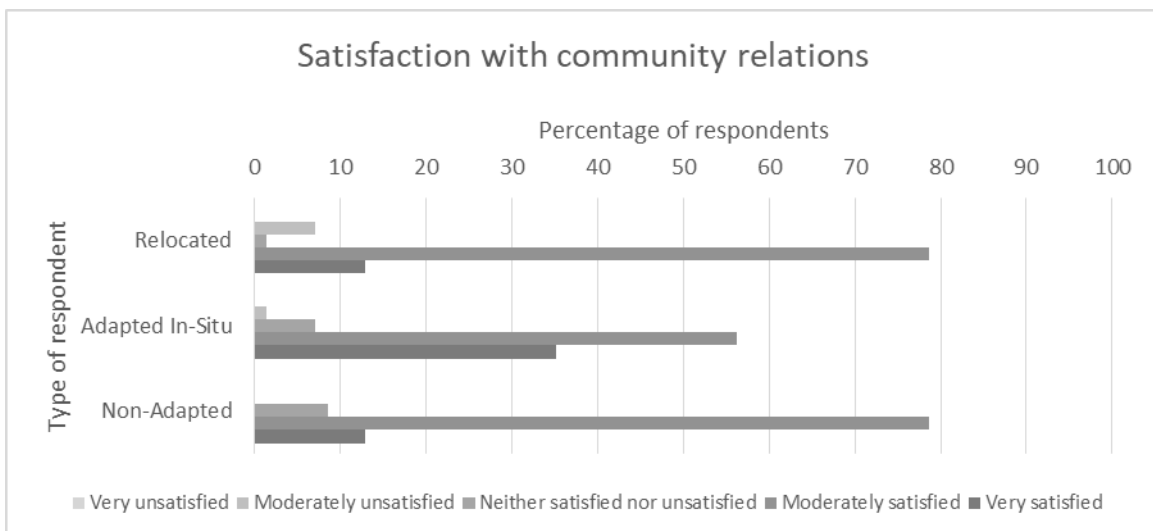


Figure 4.18. A comparison of 'Satisfaction with community relations' in Relocated, Adapted In-Situ, and Non-Adapted sub-populations.

Relocated interviewees report being satisfied with community relations on Sagar Island at the time of the study, despite experiencing community tensions in the aftermath of the Planned Relocation. However, they report having maintained relations with family and friends still living on Ghoramara Island and feeling part of their community. Non-Adapted interviewees do not raise any issues as far as family and community relations are concerned, but they are the ones that speak the least about relational matters.

In summary, Relocated respondents report the highest levels of subjective wellbeing. They are highly satisfied with their housing conditions. Whilst there are differences between those relocated first and those relocated last in terms of housing size and quality, current housing conditions represent an improvement from their conditions before the Planned Relocation, when most participants to the study were squatting. Relocated respondents are also highly satisfied with the natural environment and perceive it as safe. They recognise that due to the Planned Relocation, they are no longer exposed to environmental risks and, therefore, not at risk of losing their dwellings and farmlands. The lack of salinity intrusion also ensures that the farmland remains productive, guaranteeing a reliable crop production. This leads to high levels of satisfaction with food security. Having farmland for crop production significantly improves the food security of populations traditionally relying on subsistence agriculture.

Being relocated from Lohachara Island and Ghoramara Island to Sagar Island, a bigger and more developed island, also means that the Relocated population is able to access more work opportunities and, as a consequence, increase their economic security. With an increase in disposable income comes the ability to invest in children's education, which appears to be highly valued by Relocated respondents. In assessing their current levels of life satisfaction, Relocated respondents do so by employing comparisons. They report high levels of satisfaction with the above aspects of subjective wellbeing as a result of comparisons between their current circumstances and their circumstances before the Planned Relocation. Similarly, when assessing their conditions, they compare themselves to the circumstances of those still living on Ghoramara Island. These downward comparisons lead to positive assessments of their current circumstances.

#### **4.3.4 Relational wellbeing**

In comparing relational wellbeing across the three sub-populations, three aspects are discussed: relational selves, community relations, and societal structures. As

seen in the above sections on relational wellbeing (sections 4.2.2c, 4.2.3c, and 4.2.4c), these aspects are consistently referenced by Relocated, Adapted In-Situ, and Non-Adapted respondents.

All three types of respondents often reflect on their circumstances not at a personal level but at a community level. They see themselves as part of a group of people that are facing the same circumstances. This shared experience is discussed at length by Relocated, Adapted In-Situ, and Non-Adapted respondents alike. For example, Non-Adapted respondents that have the ability to move with family members in the inner part of the village when the coastal erosion will render their dwellings unliveable express concern about their neighbours' inability to adapt. Similarly, Relocated individuals reflect on the circumstances of those still living on Ghoramara Island. These accounts of relationality are common when circumstances related to exposure to environmental risks and government action and inaction are discussed.

Issues related to community relations are not highlighted by either of the sub-populations at the time of the study. Relocated respondents report that tensions existed between the Relocated and host households in the aftermath of the Planned Relocation. However, these were often driven by a lack of familiarity between community members. Shortly after the Planned Relocation, Relocated and host households started to integrate and rely on one another. Relocated respondents report that the support of the host communities was instrumental in their ability to build a new life on Sagar Island. Since the Planned Relocation, community relations solidified, with Relocated respondents reporting strong social attachments on Sagar Island. Nonetheless, these relations are not considered as strong as those they had whilst living on Lohachara Island and Ghoramara Island. Relocated respondents report having maintained relations with members of their original communities that are still living on Ghoramara Island and highlight that these are an important part of their social life.

Community cohesion is reported as highest in the Adapted In-Situ sub-population. Respondents report that their families have lived in the village of Beguakhali for generations and were raised with the mentality of community



living. Inhabitants of Beguakhali report relying on one another in times of need more than respondents from the other two sub-populations. The Adaptation In-situ has not affected these social attachments, as all inhabitants of Beguakhali are able to continue to live in the same village. Those who had to give away part of their land have chosen to remain and live behind the embankment. Those that had to give away all their land to make space for the construction of the embankment moved in the inner parts of the village where family members had land and allowed them to build a new dwelling there. No Adapted In-Situ respondent reports knowing anyone who chose to leave Beguakhali. Respondents spoke positively of the Adaptation In-Situ as far as their relational wellbeing is concerned.

Similarly, Non-Adapted respondents report valuing relational wellbeing and strong community relations. However, Non-Adapted interviewees focus less on relational wellbeing when discussing their circumstances. They refer to community cohesion as the 'universal law' but focus disproportionately on discussing their concerns in terms of safety and material circumstances.

Societal structures are evident in the accounts of the three sub-populations. Relocated, Adapted In-Situ, and Non-Adapted respondents alike report having had different experiences of Planned Relocation, Adaptation In-Situ, and Lack of Adaptation, respectively. Relocated respondents report on the differentiated ability of Relocated households to participate in the selection of new settlement locations on Sagar Island. This was due to the nature of the implementation of the Planned Relocation, with households relocated in the first stages being able to select the location of the new settlement through a locally-elected representative. However, within each Relocated group of households, respondents report that political supporters of the Panchayat received bigger plots of land, often close to drinking water sources.

Societal structures are also evident during the Adaptation In-Situ, with those supporting the political party receiving compensation greater than their losses, whilst the others receiving compensation lower than their losses. Adapted In-Situ households that were able to access government officials responsible for the

construction of the embankment were able to negotiate better outcomes in exchange for bribes. When reflecting on societal structures, the Non-Adapted respondents speak about the differentiated outcomes of different communities on Sagar Island. They explain that they believe the Planned Relocation and Adaptation In-Situ interventions were motivated by political and economic drivers, whilst the government does not have an interest in adapting the socially marginalised community of Dhablat.

#### **4.4 Summary of findings**

This chapter presents an analysis of multidimensional wellbeing in government action and inaction. In doing so, the presented results respond to the three research questions indicated in the introduction.

In answering research question 1.1, *'What aspects of wellbeing are valued by the three unevenly adapted sub-populations?'*, the study adopts the multidimensional wellbeing framework. Drawing on findings that emerge from the narrative interviews, the study develops a theoretically valid and locally relevant list of material, subjective, and relational criteria.

In answering research question 1.2, *'How is government action and inaction affecting the material, subjective, and relational wellbeing of the three unevenly adapted sub-populations?'*, the chapter highlights the particular importance of agricultural land for the three sub-populations. The impact of Planned Relocation, Adaptation In-Situ, and Lack of Adaptation on wellbeing is most evident in terms of land tenure and livelihoods (material wellbeing), satisfaction with the natural environment, work opportunities, economic and food security (subjective wellbeing), and community cohesion and societal structures (relational wellbeing).

In answering research question 1.3, *'How does wellbeing compare among the three unevenly adapted sub-populations?'*, the results show that in terms of material wellbeing, the Relocated sub-population is better-off in terms of the

availability of farmland whilst the Adapted In-Situ sub-population has the highest monthly income derived from stable income sources such as permanent and seasonal jobs. As far as subjective wellbeing is concerned, the Relocated sub-population has the highest levels of satisfaction across six out of eleven variables. Their assessments are often informed by comparisons with their life circumstances prior to the Planned Relocation or with the circumstances of the current inhabitants of Ghoramara Island. The Adapted In-Situ sub-population reports the highest levels of relational wellbeing and a strong community cohesion. The Non-Adapted sub-population has the lowest levels of material, subjective, and relational wellbeing when compared to the other two sub-populations.

## **Chapter 5. The impact of government action and inaction on perceptions of fairness**

Government action and inaction in the context of climate change adaptation consists of decision-making processes and outcomes, which raises concerns over distributive and procedural justice. Adaptation interventions, or lack thereof, lead people to form socially determined and contextually bound perceptions of whether the government adhered to a system of fair decision-making processes (procedural fairness) and whether the outcomes of such decisions lead to a fair distribution of benefits and burdens (distributive fairness). Therefore, perceptions of fairness are highly relevant in understanding the impacts of government action and inaction in climate change adaptation. The second aim of the study is thus to investigate perceptions of fairness in uneven adaptation interventions, namely: Planned Relocation, Adaptation In-Situ, and Lack of Adaptation. This chapter aims to answer the second research question:

*2. How is government action and inaction perceived by unevenly adapted sub-populations in terms of fairness?*

The chapter is divided into three sections, each addressing one of the research sub-questions. The first section addresses the first research sub-question: *'What aspects of fairness are valued by the three unevenly adapted sub-populations?'*. This section presents a contextual understanding of what aspects of fairness are used by the three sub-populations exposed to environmental risks and unevenly adapted (Relocated, Adapted In-Situ, and Non-Adapted) in describing government action and inaction. The results highlight several distributive and procedural aspects, ultimately validating the literature suggesting that both distributive and procedural perceptions of fairness affect policy acceptance and legitimacy.

The second section addresses the second research sub-question: *'How is government action and inaction affecting the perceptions of distributive and procedural fairness of the three unevenly adapted sub-populations?'*. It describes the perceptions of distributive and procedural fairness of Relocated, Adapted In-

Situ, and Non-Adapted individuals towards the form of adaptation intervention (or lack thereof) that they have been subject to. The third section addresses the third research sub-question: *'How do perceptions of fairness compare among the three unevenly adapted sub-populations?'*. The third section presents a comparison between perceptions of distributive and procedural fairness across the three sub-populations: Relocated, Adapted In-Situ, and Non-Adapted.

Similarly to the results on wellbeing presented in Chapter 4, the results presented in the first section of this chapter are drawn from narrative interviews (n=14), which have been conducted to explore locally relevant aspects of fairness in Relocated, Adapted In-Situ, and Non-Adapted sub-populations. These results have informed the development of fairness criteria used in this study. The chosen fairness criteria are locally relevant but also commonly used in environmental justice literature. The distributive and procedural fairness criteria have then been used to develop the survey (n=222) and additional semi-structured interviews (n=14). These quantitative and qualitative findings are presented in the second and third section of this chapter.

## **5.1 Valued aspects of fairness**

The first step in investigating perceptions of fairness in uneven adaptation interventions in Sagar Island is to understand what aspects of fairness are valued at a local level. Specifically, articulations of fairness are explored in the three sub-populations: Relocated, Adapted In-Situ and Non-Adapted. This investigation sheds light on aspects of fairness that matter to populations exposed to environmental risks and unevenly adapted. It also sheds light on whether, and if so, how, articulations of fairness vary between and within populations and issues.

The contextual understanding of aspects of fairness is drawn from narrative interviews (n=14) with Relocated, Adapted In-Situ, and Non-Adapted interviewees of different gender, age, religion, and caste. Relocated individuals that moved to three different locations on Sagar Island are included in the analysis so that potential differences could be identified (see Chapter 3, section

3.3.2b for an in-depth description of the data collection method and the socio-demographic information of respondents).

Relocated, Adapted In-Situ, and Non-Adapted respondents assess government action and inaction in terms of outcomes and decision-making processes when recounting their experience of Planned Relocation, Adaptation In-Situ, and Lack of Adaptation, respectively. These results are consistent with the environmental justice literature that argues the importance and interrelatedness of the two dimensions of justice: distributive and procedural.

All three types of respondents focus their assessments mostly on outcomes. They speak of government action and inaction in terms of 'outcome satisfaction'. Relocated and Adapted In-Situ respondents speak of 'outcome satisfaction' in terms of exposure to environmental risks, living standards, livelihood diversification, food security, and overall satisfaction with the outcomes of Planned Relocation and the Adaptation In-Situ, respectively. Those Adapted In-Situ also refer to compensation for the loss and damage of property due to the construction of the embankment when describing their satisfaction with outcomes. Non-Adapted respondents speak of 'outcome satisfaction' in terms of discrimination, exposure to environmental risks, the liveability of the area, and living standards.

When assessing the fairness of outcomes, respondents employ the criteria of 'equity', 'equality', and 'need'. For example, Relocated respondents speak of the succession of households relocated to Sagar Island and how households that had lost their dwellings and farmlands were prioritised (criterion of need). Adapted In-Situ respondents highlight issues concerning the compensation for the land acquired by the government for the construction of the embankment and the role political corruption played in it (criterion of equity). Non-Adapted respondents highlight the differentiated government adaptation interventions across the communities of Sagar Island (criterion of equality). Respondents, however, use different criteria when assessing different aspects of government action and inaction and sometimes make trade-offs between criteria depending on the outcome aspect they reflect upon. Overall, 'outcome satisfaction' is the most

frequently used aspect of fairness by Relocated, Adapted In-Situ, and Non-Adapted respondents. In comparison to criteria such as 'equity', 'equality', and 'need', respondents infer the most importance when discussing 'outcome satisfaction'.

Respondents also raise concerns regarding government decision-making processes, which form the procedural fairness criteria. Relocated, Adapted In-Situ, and Non-Adapted respondents articulate issues of decision-making processes in terms of 'participation', 'voice', 'consideration', and 'process control'. Respondents speak of (i) the ability to participate in consultation meetings, (ii) the ability to voice their preferences and opinions, (iii) the ability to have their preferences and opinions taken into consideration by decision-makers, and (iv) the ability to have their preferences and opinions included in the final decision and influence outcomes. For example, some Relocated respondents describe the process of being able to select the new settlement location on Sagar Island. Adapted In-Situ and Non-Adapted respondents reflect on their inability to influence the government's decisions, either when choosing to intervene or not. Relocated, Adapted In-Situ, and Non-Adapted respondents speak of procedural aspects less. In comparison to distributive aspects, they infer less importance when referring to procedural aspects in their assessments of government action and inaction.

From these initial narrative interviews, this study identifies distributive and procedural aspects of fairness that are locally relevant. These qualitative findings are then compared to distributive and procedural fairness criteria identified in the environmental justice literature. This triangulation exercise shows that the aspects of fairness raised by Relocated, Adapted In-Situ, and Non-Adapted respondents are commonly used in other environmental studies and are extensively discussed in the environmental justice literature. This means that the chosen perceptions of fairness criteria for this study are both theoretically valid and locally relevant. These eight criteria of distributive and procedural justice are used in the survey and semi-structured interviews.

## **5.2 Perceptions of fairness**

### **5.2.1 A guidance on how to navigate the results sections on perceptions of fairness**

Drawing on an analysis of quantitative (survey n=222) and qualitative (semi-structured interviews n=14) data, perceptions of fairness in government action and inaction are presented. Whilst the results of the narrative interviews are used for the purpose of understanding locally valued aspects of fairness and inform the development of surveys and semi-structured interviews, the results of the semi-structured interviews are used to provide a detailed understanding of the perceptions of distributive and procedural fairness of the three sub-populations.

The following sections of this chapter present the results on the perceptions of fairness of Relocated, Adapted In-Situ, and Non-Adapted respondents. Results on perceptions of distributive justice are presented in terms of 'outcome satisfaction', 'equity', 'equality', and 'need'. Results on perceptions of procedural justice are presented in terms of 'participation', 'voice', 'consideration', and 'process control'. Perceptions on all distributive and procedural criteria are rated on a five-point Likert scale. The eight ordinal indicators used to measure perceptions of fairness range from one to five (1 = disagree strongly; 2 = disagree a little; 3 = neither agree nor disagree; 4 = agree a little; 5 = agree strongly).

In order to aid the reader in navigating the below results sections, a colour coding system is applied throughout the chapter. The relevant figures and graphs are either in blue (for results related to the Planned Relocation), in green (for results related to the Adaptation In-Situ), or in orange (for results related to the Lack of Adaptation).



## 5.2.2 Relocated respondents' perceptions of fairness

### a) Perceptions of distributive fairness

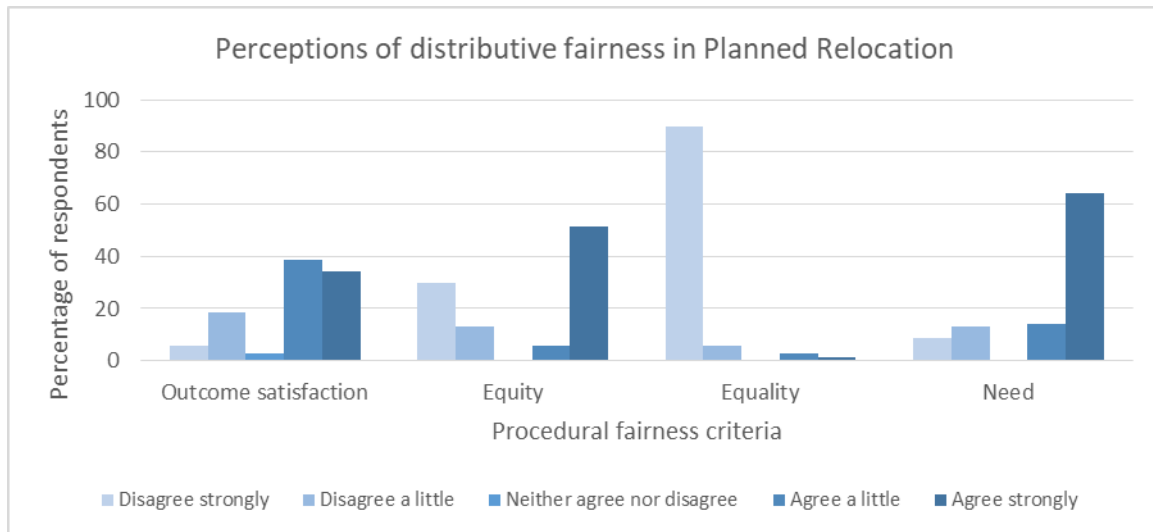


Figure 5.1. Frequencies of perceptions of distributive fairness in the Relocated sub-population.

When assessing the perceptions of fairness of the Relocated individuals, results show a greater focus on distributive matters than procedural matters. Qualitative results show that the outcome of the Planned Relocation is the most important aspect used in the assessment of the fairness of government action. 73% of Relocated respondents agree or strongly agree when asked whether they are satisfied with the overall outcome of the Planned Relocation (Figure 5.1). Sahil, a 72-year-old man that has been relocated from the coastal area of Ghoramara Island to Jibontala in the early stages of the Planned Relocation, states:

*“We are better here than there.”*

When making an overall comparison of how his life was on Ghoramara Island versus how his life is on Sagar Island, he assesses it as overall being ‘better’. During the interview, he elaborates that he and his family are ‘better’ in terms of exposure to environmental risks and livelihoods. Similarly, other Relocated interviewees speak of ‘outcome satisfaction’ in terms of exposure to environmental risks, living standards, livelihood diversification, food security, and infrastructure. For example, Marjane, a 35-year-old woman now living in Jibontala, speaks of her family’s life on Sagar Island.

*“Here peace means [that there is] food, and somewhere to stay [a dwelling].”*

She describes her life on Sagar Island as peaceful. She explains that the availability of food and safe shelter are what makes her and her family’s life peaceful. These two aspects – food and housing – seem particularly relevant in her assessment of Planned Relocation outcomes. Throughout the interview, Marjane presents her evaluation of Planned Relocation in a comparative way, by reflecting on the differences between her circumstances before the adaptation intervention and the present time. These comparative assessments are common in interviews with Relocated respondents.

As far as outcomes regarding exposure to environmental risks are concerned, interviewees disagree on the matter. Individuals that have been relocated to the inner areas of Sagar Island report that their exposure to environmental risks has considerably lessened, whilst those that have been relocated to the coastal areas of Sagar Island report that they are exposed to coastal erosion. However, they recognise that this issue is not as severe as on Ghoramara Island.

Relocated respondents also form their perceptions of distributive fairness using the criteria of ‘need’ and ‘equality’ interchangeably, depending on which aspect of the Planned Relocation outcome they are reflecting upon. Households living on the coastal areas of Lohachara Island and Ghoramara Island that lost their dwellings and agricultural lands were relocated first. 79% of Relocated respondents agree or strongly agree that those most in need have been relocated first (Figure 5.1). When arriving on Sagar Island, these first relocated households received the same planned relocation package consisting of the same amount of land, a dwelling, and a pond. In this context, the Relocated households that moved to Sagar Island at the same time and in the same location received equal benefits.

However, the subsequent Relocated households received increasingly less land (often forested or saline) and no dwelling or pond. When reflecting on these differences, respondents form their perceptions of distributive fairness using the criterion of ‘equality’. 96% of Relocated respondents disagree or strongly

disagree that the Planned Relocation outcomes are equal among Relocated households (Figure 5.1). These responses are in reference to the comparison between relocated groups, namely between those relocated at earlier stages versus those relocated at later stages on Sagar Island. Salina, a 30-year-old woman that has been relocated with her family from Ghoramara Island among the last households, explains:

*“People came in groups. They [the households that were relocated first] are doing better than us. They got more land.”*

She assesses the outcomes of the Planned Relocation using the criterion of ‘equality’ by articulating that families that were relocated before hers received more land. She associates the unequal outcomes with unequal life standards. Salina compares her family’s situation to those relocated first by saying that they ‘are doing better’. She contextualises the idea of ‘doing better’ in terms of the amount of agricultural land owned, highlighting the importance of land for communities that traditionally relied on subsistence agriculture.

#### **b) Perceptions of procedural fairness**

As far as the procedural aspects of the Planned Relocation are concerned, 84% of Relocated respondents strongly agree that they were able to ‘participate’ in the decision-making process (Figure 5.2). It appears, however, that respondents form their perceptions of procedural fairness not based on their ability to participate in the decision-making process on whether to relocate but based on their ability to participate in the implementation process by choosing the preferred location to be relocated to. There was limited community engagement in the decision-making process on how to best adapt the inhabitants of Lohachara Island and Ghoramara Island. There were no consultation meetings to gather communities’ views on the potential Planned Relocation.

Relocated respondents recount that unbeknownst to them, the Pradhan (the village-level ‘leader’ of the Panchayat, which is the point of contact between government officials and the village community) represented them during

discussions with the MLA (the Member of the Legislative Assembly which is the representative of an electoral district to the legislature of State government in the Indian system of government). The Pradhan was the one to compile and provide the MLA with a list of households in need of adaptation support. These households were then informed that they were being relocated to Sagar Island. When asked to state whether they believe their views and preferences were taken into consideration, 91% of respondents strongly disagreed (Figure 5.2).

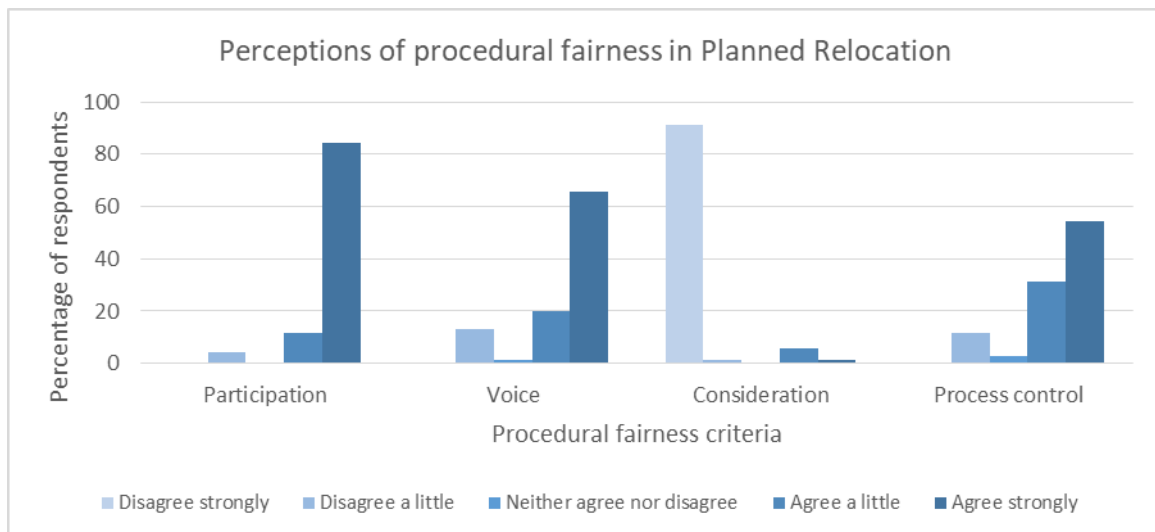


Figure 5.2. Frequencies of perceptions of procedural fairness in the Relocated sub-population.

Tulsi, an 80-year-old man that has been relocated to Bankimnagar, says:

*“We have [local] leaders. They suggest suitable [adaptation] measures and we follow. We are commoners. We have not got such opportunities.”*

He explains that his opinions on the Planned Relocation were not considered. He describes his community as ‘commoners’ that traditionally were not given the opportunity to be involved in decision-making processes. However, he did not expect that to be the case. He places the responsibility of enforcing suitable adaptation interventions on the local leaders, which the community then follows. In his opinion, and like him other interviewees that discuss ‘participation’ and ‘consideration’ regarding the decision-making processes, the community follows the adaptation measures proposed by the government. They do not have the opportunity, nor expect, to have a say in such decisions.

Some Relocated respondents, however, feel that they were somehow able to participate in the implementation process of the Planned Relocation. The households that were relocated in the first stages of the Planned Relocation were allowed to choose their preferred location from those designated by officials on Sagar Island. However, not everyone was able to take part in this process and voice their opinions directly as they were asked to elect a community representative instead. Anusha, a 72-year-old woman from Ghoramara Island, explains:

*“We [the households that were selected to be relocated first] organized a meeting and selected a candidate [to represent us]. We were one island which was gradually vanishing, from that we selected one representative so we will accept his decision [...] whatever he will do we will happily accept that [...] then we were helpless.”*

She explains that they elected a community member as their representative to liaise with the officials implementing the Planned Relocation. She explains that the community did not have expectations regarding their direct participation in such processes. Anusha describes the critical situation that her family and community were living in by referring to Ghoramara Island as an ‘island which was gradually vanishing’, meaning that they were exposed to severe coastal erosion. She says they were ‘helpless’ at the time, and thus they were willing to accept whatever decision their representative would take. Regardless of the location chosen on Sagar Island, they would ‘happily accept that’. This shows a lack of expectation as far as the ability to voice one’s opinions and preferences in decision-making processes is concerned. It also demonstrates that when individuals find themselves in situations where they cannot adapt and feel ‘helpless’, they are willing to accept any adaptation measure that is offered, regardless of process. In this way, respondents indicate that they do not form their perceptions of fairness as far as the Planned Relocation is concerned based on processes but on outcomes.

Having had the opportunity to have a representative select a preferred site on Sagar Island makes locals feel that they had the ability to express their views and opinions. 66% of respondents strongly agree that they had a ‘voice’ in the process

(Figure 5.2). This leads to 54% of respondents strongly agreeing with the statement that they had a level of 'process control' in the Planned Relocation (Figure 5.2). The ability of groups of individuals to have a representative that was given the possibility to choose a location on Sagar Island, however, diminished in time. As an increasing number of households were relocated and the available land on Sagar Island was running out, households relocated at later stages were left with no choice but to move to the remaining available sites. When the available land on Sagar Island ran out, the Planned Relocation terminated, leaving many inhabitants on Ghoramara Island feeling trapped and in need of government support.

In summary, the Relocated sub-population forms their perceptions of fairness in relation to the distribution of beneficial and adverse outcomes. Overall, respondents report that the Planned Relocation outcome was fair, with those that needed it most being relocated first and those relocated at the same time receiving equal benefits. Issues concerning unequal outcomes are raised by respondents who were relocated during the later stages of the planned relocation and that received fewer benefits in terms of agricultural land and housing. Respondents do not report having had expectations as far as procedural matters are concerned. However, those that had a say in choosing the location for their new settlement report having perceived the Planned Relocation as fairer than those that have not had this opportunity. Perceptions of fairness here are nonetheless formed in distributive terms: those that had a say were able to choose a better location, which led to better outcomes; those that have not had a say were relocated to locations on the coastal area of Sagar Island exposed to coastal erosion, which led to worse outcomes.

### **5.2.3 Adapted In-Situ respondents' perceptions of fairness**

#### **a) Perceptions of distributive fairness**

72% of Adapted In-Situ respondents disagree or strongly disagree when asked whether they find the overall outcome of the Adaptation In-Situ to be satisfactory

(Figure 5.3). Interviewees speak of outcome satisfaction mostly in terms of compensation for the loss of property – in the form of dwellings and agricultural lands – due to the construction of the embankment. They form their perceptions of fairness with regard to outcome by applying the criterion of equity (households were promised compensation in proportion to losses) and equality (households were discriminated against in the compensation process; thus, some have not received the promised equitable compensation).

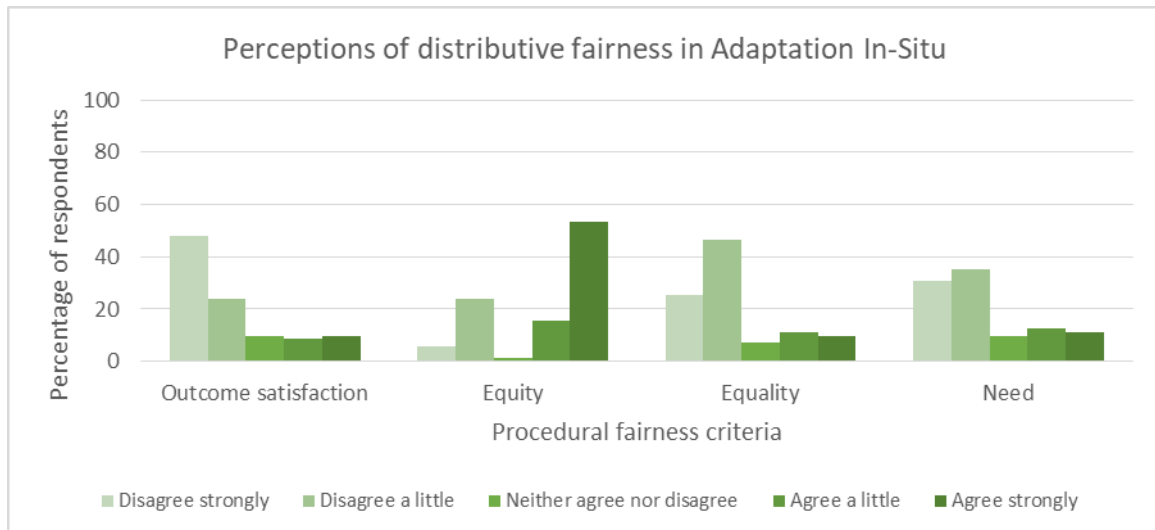


Figure 5.3. Frequencies of perceptions of distributive fairness in the Adapted In-Situ sub-population.

Adapted In-Situ interviewees explain that the Panchayat (the village council) assured them that households would receive compensation in proportion to their losses caused by the construction of the embankment. Binay, a 54-year-old man from Beguakhali, explains:

*“[Compensation was given] according to the land area. Like those who lost 5 katthas of land, they got money for 5 katthas [of land]. Some lost 2 Bighas [of land], so they got [compensation] for 2 Bighas [of land].”*

Binay’s understanding of equitable compensation is common among the Adapted In-Situ interviewees. When survey respondents are asked to what extent they agree with the statement that they ‘received benefits in proportion to losses’, 69% agree or strongly agree, whilst 30% disagree or strongly disagree (Figure 5.3). Issues related to compensation arise due to the unequal treatment of households.

Discrimination in outcomes, as far as compensation is concerned, occurred in different ways. An initial land survey was supposed to delineate the land needed for the construction of the embankment and assess specifically whose property and how much of it was needed. This land survey, however, was not accurate. Interviewees argue that households openly supporting the political party in power at the time were given their land survey document indicating higher amounts of land than what they owned. This meant that they were assigned a higher compensation than they were due. Sumana, a 79-year-old woman from Beguakhali, says:

*“It all depends on how well one could socialise with [the] party and in that way one could get the benefits.”*

This shows that members of the community that were having relations with the political party were able to leverage their position and receive disproportionate benefits. On the other hand, other households were given their respective land survey document indicating lower amounts of land than their actual plot. This meant that they were assigned to receive less compensation than they were due. Households whose land was undervalued brought this issue to the attention of the Panchayat before the construction of the embankment started. Ismail Babu, a 68-year-old man from Beguakhali, explains what happened when he raised concerns with regard to the incorrect survey of his land:

*“[After I complained] it was concluded [by the Panchayat] that whatever Ismail Babu complained about [having] 3 Bigha [of land] was actually true. He got [assigned compensation] for 1.5 Bigha [of land] and what about the rest of it? So, [the authorities said]: ‘Ismail Babu, I am taking the responsibility that you get the total amount [of compensation that is due to you]. Now, please give the permission [to start work on your property] so that the embankment can be built’. I gave the permission. The embankment was being built and now it’s complete but I did not receive the money [...] The rest [of the compensation] is yet to be paid. Like me, there are other poor people [in the same conditions].”*

The case of Ismail Babu shows that when the issue of incorrect land surveys was raised, the Panchayat acknowledged that his land survey document was incorrect and assured him that the issue would be rectified. However, to date, this has not been done. Ismail Babu states that many people in Beguakhali have had the



same experience. Issues of procedural fairness, such as ‘consideration’ and ‘process control’ are interwoven here. The concerns of Ismail Babu, whilst they were acknowledged by the decision-makers and recognised as valid, they were not taken into consideration. Ultimately, he was not able to have control over the process of compensation distribution. Other interviewees report that unequal treatment in compensation distribution was also influenced by corruption. Those who had the means to bribe the Aila officers responsible for managing the Adaptation In-Situ did so. Due to these issues related to compensation processes, 72% disagree or strongly disagree that compensation was equal (Figure 5.3).

When assessing the outcome of the Adaptation In-Situ in terms of the impact it has on livelihoods, respondents have divergent opinions. Concerns regarding livelihoods are raised by interviewees who received less compensation than they were due and by those with small plots of land who received little compensation. Some respondents explain that the compensation they received was below the market value of their land and, consequently, was not enough to cover the costs for the purchase of a new plot of land. Lanisha, a 60-year-old woman from Beguakhali, describes that her family lost most of their agricultural land to the construction of the embankment. The compensation they were given was little, so the family continued to live in their original dwelling without being able to purchase additional agricultural land. Lanisha says:

*“For us village people, we will have to rear few animals, or we have to store fuel wood, or we need to store the harvested paddy, and any other things. We need to make a garden, otherwise, how will we eat with that little money? We have to manage to make a garden which we are [now] unable to do so.”*

She explains how her family relies on subsistence agriculture and the difficulties they are facing now that they do not have enough agricultural land to fulfil their needs. A reduction in the amount of agricultural land available leads to issues with livelihoods, especially for those who were practising traditional subsistence agriculture prior to the construction of the embankment. On the contrary, respondents that still own their original agricultural land and dwelling speak of the outcomes of the Adaptation In-Stu in terms of improved livelihoods. They find that

the protection provided by the embankment against flooding prevents saltwater intrusion on thus offers protection for their crops.

Adapted In-Situ respondents chose to speak about distributive concerns disproportionately in terms of compensation and the impact this had on livelihoods. Issues of discrimination and political corruption lead individuals to perceive the outcome of the Adaptation In-situ as unfair. When prompted to reflect on distributive outcomes regarding the exposure to environmental risks, respondents have different opinions regarding short-term versus long-term adaptation prospects. Interviewees recognise the benefits the embankment brings in terms of a decreased exposure to coastal erosion and flooding. These benefits led to a return to the cultivation of agricultural lands and investments in dwelling improvements without concerns of losses due to environmental risks. However, interviewees do not believe the Adaptation In-Situ is a viable long-term adaptation strategy. Even though five out of seven interviewees report feeling much safer than before the embankment was built, six out of seven respondents say they do not feel this is a permanent solution. For example, Mihir, a 30-year-old man from Beguakhali, says when reflecting on the choice of the government to intervene and adapt his community in-situ:

*“Let them [the authorities] do what they will do [in terms of adaptation] because we will have to float anyway. We know it ourselves that we will float.”*

Mihir, like other Adapted In-Situ interviewees, raises concerns about the liveability of Beguakhali in the future. They argue that Sagar Island is facing the same fate as Lohachara Island, which is now completely submerged, and Ghoramara Island, which is eroding at a fast rate.

#### **b) Perceptions of procedural fairness**

When discussing perceptions of fairness in relation to procedural concerns, Adapted In-Situ respondents have rather polarized opinions (Figure 3.4). When asked whether the inhabitants of Beguakhali were invited to participate in community consultation meetings prior to the decision to adapt the population in-

situ, respondents give contradicting responses. 58% of Adapted In-Situ survey respondents strongly agree with the statement on ‘participation’ whilst 37% disagree or strongly disagree (Figure 5.4). Interviewees also exhibit this difference of opinion. Binay, when recounting the initial stages of when he learnt about the possibility of the construction of an embankment, says:

*“The whole village was called [to a consultation meeting] and [a participatory] discussion was held.”*

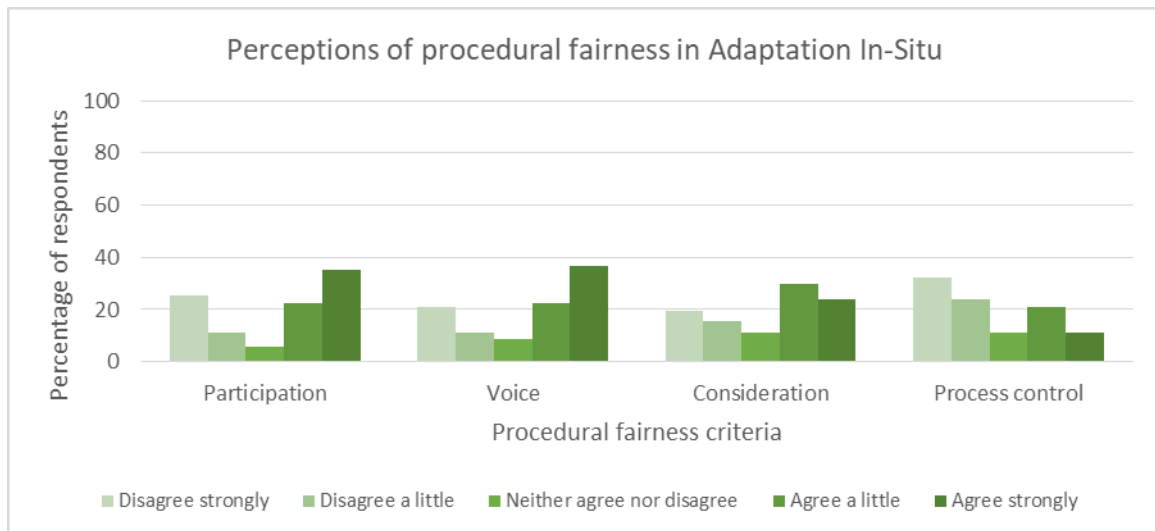


Figure 5.4. Frequencies of perceptions of procedural fairness in the Adapted In-Situ sub-population.

Like Binay, other respondents report feeling they had a say in whether they wanted the embankment to be built, and this, to some extent, led to them feeling that they had some control over the decision-making process. On the contrary, Shouvik, a 45-year-old man, disagrees with Binay.

*“We did not know anything [the construction of embankment] from before [the construction started]. Nothing was announced previously. Nothing.”*

During the interview, Shouvik explains that he learnt about the construction of the embankment only when the land survey for the compensation process began. He was not aware of a proposal to build an embankment beforehand. Similarly, the results on perceptions of fairness regarding the locals’ ability to voice opinions and preferences are also polarized, with 59% agreeing or strongly agreeing and 33% disagreeing or strongly disagreeing with the survey statement on ‘voice’ (Figure 5.4). However, interviewees explain that the ability to have a voice in the

decision-making process was irrelevant considering their circumstances. Sumana, a 79-year-old woman, explains that she does not perceive it as important to have the ability to voice her preferences.

*“What about [having a] say, we are depending upon survival.”*

She explains that her community relied on government action to ‘survive’, so focusing on personal preferences and opinions is not seen as important considering the circumstances. Other interviewees, such as Lanisha, say that it was not the locals’ place to have an opinion.

*“What to consider our views? (laughs) Views! (laughs). It all depends on the Panchayat and on the government. [...] The water level is such we did not have any other option, whatever the government will say we have to follow them.”*

Lanisha explains that decisions regarding adaptation interventions were made by the Panchayat and the State government and that locals had no opportunity to express their views. Nonetheless, she does not think that locals have a place in such decision-making processes. When specifically asked about her ability to express her views, she laughs. She also shares Sumana’s opinion, highlighting that the exposure to environmental risks was so high that the community accepted whatever form of government support.

In summary, Adapted In-Situ respondents form their perceptions of fairness regarding the adaptation intervention in relation to distributive concerns. They apply the criteria of equity and equality when assessing the fairness of the distribution of benefits and burdens, specifically regarding compensation for lost property. Opinions on procedural fairness vary, but overall expectations of government action are low. Respondents highlight that their exposure to environmental risks before the Adaptation In-Situ was severe, and thus any adaptation intervention would have been welcomed by the community. Furthermore, Adapted In-Situ respondents do not believe that it was their role to be involved in governmental decision-making processes.

## 5.2.4 Non-Adapted respondents' perceptions of fairness

### a) Perceptions of distributive fairness

The Non-Adapted sub-population reports negative perceptions of fairness as far as distributive outcomes are concerned (Figure 5.5). Overall, 86% of the survey respondents strongly disagree with the statement that the adaptation intervention is satisfactory. Farid, a 48-year-old man, and Prasad, a 60-year-old man from Dhablat, explain, respectively:

*“The government is not taking any necessary steps.”*

*“Houses are being destroyed, lands have been submerged, how to survive that is the major concern”*

They report that the government is not taking any action in terms of providing the needed adaptation support. They also describe the consequences of this Lack of Adaptation in terms of damages to their dwellings and a loss of agricultural land. Explicitly, Prasad states that these circumstances are so severe that they are concerned about how ‘to survive’ this situation. Similarly to Prasad, interviewees raise concerns about the liveability of Dhablat, and their children’s future if the government chooses not to intervene.

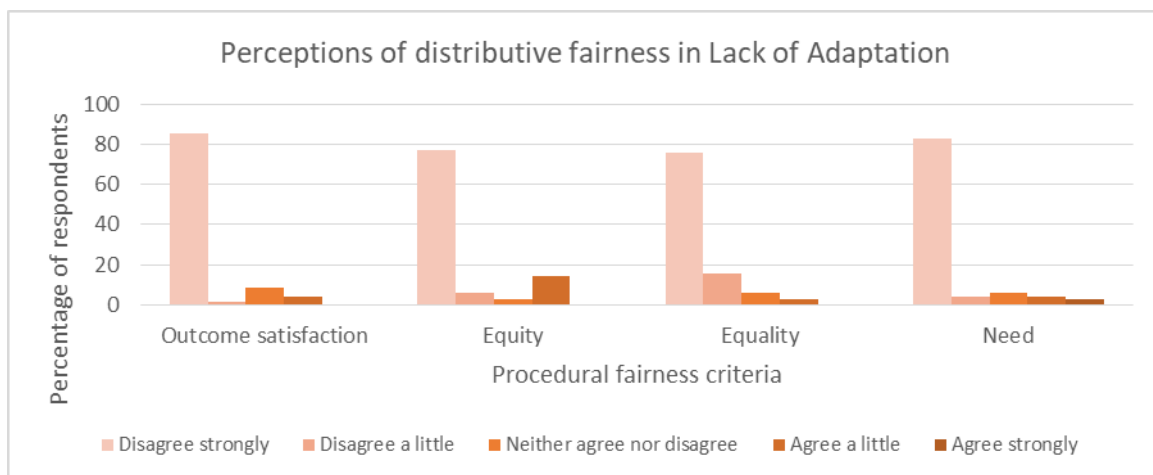


Figure 5.5. Frequencies of perceptions of distributive fairness in the Non-Adapted sub-population.

In assessing the distributive outcomes, the Non-Adapted respondents apply the criteria of equality and need. First, interviewees describe the outcome of the Lack of Adaptation in terms of unequal consideration given by the government to

diverse coastal communities on Sagar Island. Interviewees describe that their village, Dhablat, as well as the neighbouring village of Beguakhali, have been severely affected by cyclone Aila. However, the government chose to invest in adaptation in-situ in Beguakhali, whilst no adaptation intervention has so far been proposed in Dhablat. Non-Adapted respondents explain this unequal government response by referencing the economic interests tied to the village of Beguakhali. There, respondents say, the government is planning to build a deep-sea port and thus the embankment is necessary.

Second, Non-Adapted interviewees describe the outcome of the Lack of Adaptation in terms of need. They explain that the government chose to relocate the inhabitants of Lohachara Island and Ghoramara Island to Sagar Island as they were the most in need of support at that time. However, in time, the land available on Sagar Island ran out and therefore the Planned Relocation came to an end. There is no remaining available land on Sagar Island, and respondents explain that this means that the government has nowhere to relocate them. Non-Adapted interviewees make sense of the Lack of Adaptation by explaining, and to some extent justifying the government's uneven decisions on how to intervene. Survey respondents, however, report negative perceptions of distributive fairness when applying the criteria of equality and need. 91% of Non-Adapted survey respondents disagree or strongly disagree with the statement that the adaptation interventions are taking place in an equal manner and 87% disagree or strongly disagree with the statement that adaptation interventions are taking place based on need (Figure 5.5).

#### **b) Perceptions of procedural fairness**

Non-Adapted survey respondents agree or strongly agree when asked whether they have been able to participate (88%) and express their views (94%) in decision-making processes on potential adaptation interventions in Dhablat (Figure 5.6). Interviewees clarify that these participatory consultation meetings only took place with community leaders and the Panchayat, and locals were

never involved in such discussions with State government officials. When directly asked whether the government engaged in any discussions on adaptation interventions with the local community, respondents say no.

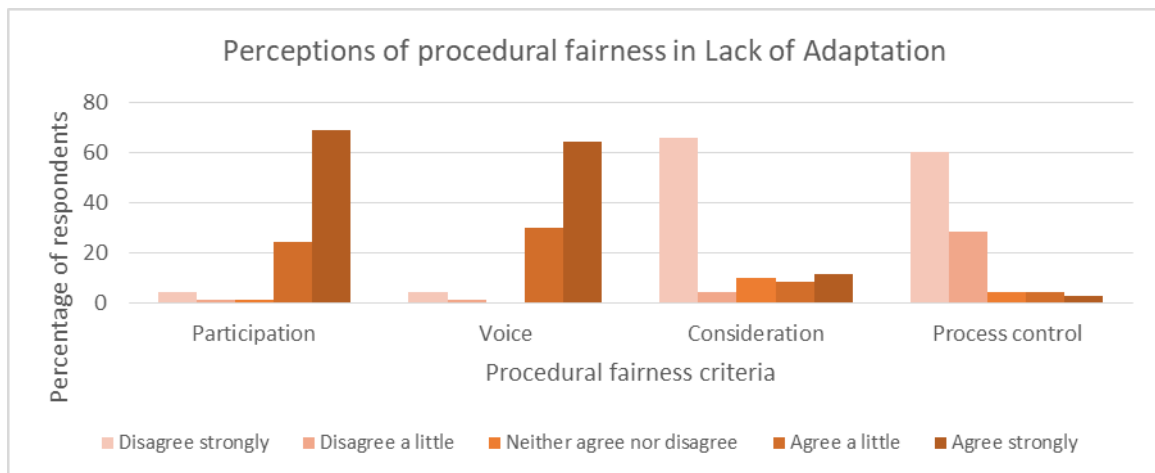


Figure 5.6. Frequencies of perceptions of procedural fairness in the Non-Adapted sub-population.

Therefore, when reporting that Non-Adapted individuals feel they have a ‘voice’, this does not refer to their ability to express their opinions and preferences during consultation meetings with State government officials. Instead, respondents refer to their initiatives to make their need for adaptation interventions known and have their voices heard by the community leaders and the Panchayat. Prasad explains:

*“We told [the community leaders and the Panchayat] many times [that we need an adaptation intervention], many times. We are saying that you do not have to give us money [compensation], [...] we will give you our land you just make the embankment”.*

Prasad describes that the local community approached community leaders and the Panchayat many times to ask them to put pressure on State government officials and request an embankment so the community can be adapted in-situ. He also explains that the local community expressed their willingness to give away whatever agricultural land they have left on the coastal areas of Dhablat, without wanting any compensation, so that an embankment could be built. Prasad explains that they are not seeking compensation for that land. Despite their efforts, 70% of survey respondents say that their pleas are never taken into consideration (Figure 5.6).

When discussing interviewees' expectations about the decision-making process, it transpires that they do not have any expectations. Their perceptions of unfairness are based on the lack of adaptation as an outcome. Farid explains:

*"They [the State government officials] can come and say: 'I have come to make the embankment here as we are from the government. Whose place is thus? Ram Babu's? Ram Babu, this land will be taken. We have come from the government so give the land. Why will I not give the land then? I am already floating in water so why will I not give my land so that I can build another house. [...] but they [the State government officials] did not offer us this [option]."*

Farid's response is a good example of the locals' views and perceived roles in procedural matters. Farid explains that if the State government asked him to give away his land so that an embankment could be built, he would give it away without feeling the need to be involved in any decision-making process. He seems interested only in the outcomes of such process. This view is enhanced by the severity of his exposure to environmental risks and the urgent need for support.

In summary, Non-Adapted respondents form their perceptions of fairness regarding the Lack of Adaptation in relation to distributive concerns. They apply the criteria of equality and need when assessing the fairness of unequal forms of government action and inaction. Whilst respondents seem to justify the government action taken in Beguakhali (Adaptation In-Situ) due to economic interests, and Lohachara Island and Ghoramara Island (Planned Relocation) due to the severity of exposure to environmental risks, they, however, perceive the overall uneven outcome as unfair. Perceptions of procedural fairness appear to be of no importance, as respondents specifically highlight that they have no expectations as far as processes are concerned; they are only interested in being adapted.



## **5.3 A comparison of perceptions of fairness between Relocated, Adapted In-Situ, and Non-Adapted sub-populations**

### **5.3.1 A guidance on how to navigate the results sections on comparisons of perceptions of fairness**

Comparisons of perceptions of fairness of government action and inaction across the three sub-populations – Relocated, Adapted In-Situ, and Non-Adapted – are discussed here. Differences in perceptions between sub-populations are mostly assessed in terms of distributive matters. This is due to the disproportionate importance that Relocated, Adapted In-Situ, and Non-Adapted respondents give to distributive issues compared to procedural ones. The results presented here are drawn from a combination of quantitative (surveys n=222) and qualitative (semi-structured interviews n=14) data analysis.

As far as the quantitative results are concerned, measures of frequency as well as results of inferential statistics (mean ranks) are reported. The inferential statistics are drawn from the results of Kruskal-Wallis H tests followed by Dunn's procedure with a Bonferroni correction for multiple comparisons. This is used to shed light on statistically significant differences between the mean ranks of each sub-population's response in relation to each fairness criterion. Figures 5.7 – 5.14 depict comparisons of frequencies of perceptions of fairness across the eight criteria of fairness and among the three sub-populations. Responses are measured on a five-point Likert scale and are reported as frequencies. Table 5.1 depicts the results of inferential statistical tests.

Dimension	Criteria	Population	Mean rank	Statistically significant differences between sub-populations	Pairwise comparisons	Statistically significant differences in mean ranks
Distributive fairness	Outcome satisfaction	Relocated	157	YES: $\chi^2(2) = 97.460, p < .0005$  YES: $\chi^2(2) = 79.282, p < .0005$  YES: $\chi^2(2) = 68.953, p < .0005$  YES: $\chi^2(2) = 98.028, p < .0005$  YES: $\chi^2(2) = 44.705, p < .0005$  YES: $\chi^2(2) = 22.503, p < .0005$  YES: $\chi^2(2) = 71.783, p < .0005$  YES: $\chi^2(2) = 99.668, p < .0005$	Non-Adapted vs Adapted In-Situ	YES ( $p < .0005$ )
		Adapted In-Situ	97		Non-Adapted vs Relocated	YES ( $p < .0005$ )
	Equity	Non-Adapted	62		Adapted In-Situ vs Relocated	YES ( $p < .0005$ )
		Relocated	120		Relocated vs Non-Adapted	NO ( $p = .346$ )
		Adapted In-Situ	140		Relocated vs Adapted In-Situ	YES ( $p < .0005$ )
		Non-Adapted	57		Non-Adapted vs Adapted In-Situ	YES ( $p < .0005$ )
	Equality	Relocated	78		Non-Adapted vs Relocated	YES ( $p < .0005$ )
		Adapted In-Situ	147		Non-Adapted vs Adapted In-Situ	YES ( $p < .0005$ )
	Need	Non-Adapted	92		Relocated vs Adapted In-Situ	NO ( $p = .138$ )
		Relocated	156		Non-Adapted vs Adapted In-Situ	YES ( $p < .0005$ )
	Participation	Adapted In-Situ	101		Non-Adapted vs Relocated	YES ( $p < .0005$ )
		Non-Adapted	59		Adapted In-Situ vs Relocated	YES ( $p < .0005$ )
Relocated		130	Adapted In-Situ vs Non-Adapted	YES ( $p < .0005$ )		
Adapted In-Situ		72	Adapted In-Situ vs Relocated	YES ( $p < .0005$ )		
Voice	Non-Adapted	115	Non-Adapted vs Relocated	NO ( $p = .267$ )		
	Relocated	117	Adapted In-Situ vs Relocated	YES ( $p < .0005$ )		
	Adapted In-Situ	80	Adapted In-Situ vs Non-Adapted	YES ( $p < .0005$ )		
	Non-Adapted	119	Relocated vs Non-Adapted	NO ( $p = 1$ )		
Consideration	Relocated	71	Relocated vs Non-Adapted	YES ( $p = .010$ )		
	Adapted In-Situ	147	Relocated vs Adapted In-Situ	YES ( $p < .0005$ )		
	Non-Adapted	98	Non-Adapted vs Adapted In-Situ	YES ( $p < .0005$ )		
	Relocated	160	Non-Adapted vs Adapted In-Situ	YES ( $p = .002$ )		
Process control	Adapted In-Situ	96	Non-Adapted vs Relocated	YES ( $p < .0005$ )		
	Non-Adapted	61	Adapted In-Situ vs Relocated	YES ( $p < .0005$ )		

Table 5.1. Statistically significant differences in perceptions of distributive and procedural fairness between Relocated, Adapted In-Situ and Non-Adapted sub-populations.

### 5.3.2 A comparison of perceptions of distributive fairness

Statistically significant differences in survey responses on distributive fairness are present between the three sub-populations for all four variables. The most significant differences across distributive fairness variables lie between the Non-Adapted respondents and the two differently adapted sub-populations. The Non-Adapted respondents perceive the outcomes as unfair across all distributive variables. The Relocated and the Adapted In-Situ responses vary across variables. As far as 'outcome satisfaction' is concerned, the Relocated respondents are satisfied with the outcomes of the Planned Relocation, as opposed to the Adapted In-Situ and Non-Adapted respondents. 73% of the Relocated respondents agree or strongly agree that the outcome was satisfactory (Figure 5.7). In contrast, 94% of the Non-Adapted respondents and 72% of the Adapted In-Situ respondents disagree or strongly disagree with the statement that the outcome was satisfactory (Figure 5.7).

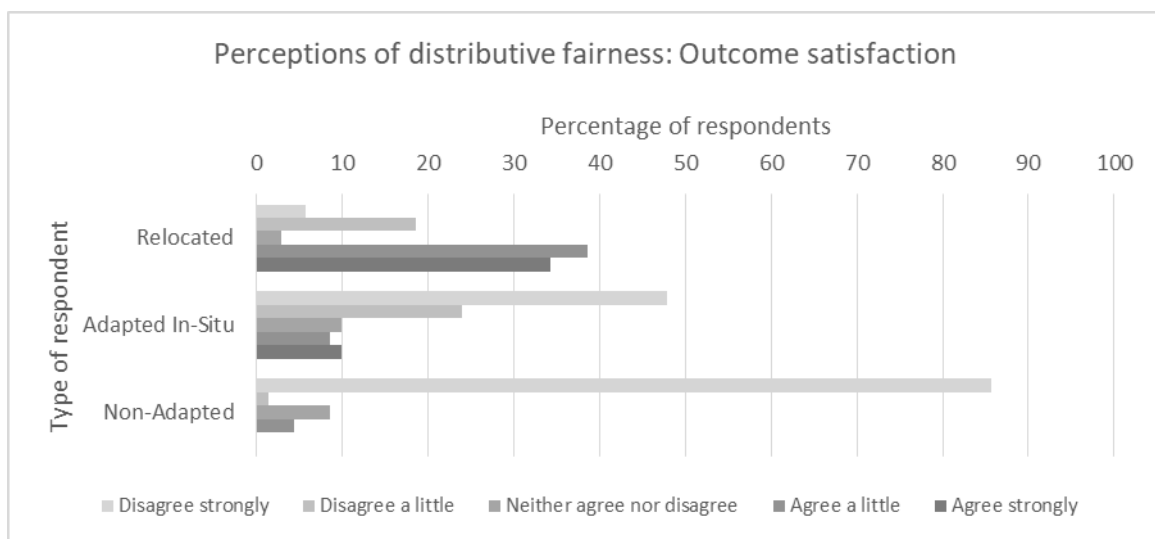


Figure 5.7. A comparison of 'Outcome satisfaction' in Relocated, Adapted In-Situ and Non-Adapted sub-populations.

Pairwise comparisons of the mean ranks of the three sub-populations show that there are statistically significant differences between all three sub-populations: between Non-Adapted and Adapted In-Situ ( $p = .001$ ), between Non-Adapted and Relocated ( $p < .0005$ ), and between Adapted In-Situ and Relocated ( $p < .0005$ ) (with  $p$  representing the statistical significance) (Table 5.1). The interviews shed

light on this discrepancy. Relocated respondents are more satisfied with government action outcomes as they have received plots of land as part of the Planned Relocation programme. This allows them to continue subsistence agriculture practices and to rely on traditional forms of livelihoods. On the contrary, both Adapted In-Situ and Non-Adapted respondents lost a portion or all their agricultural land to the construction of the embankment or the coastal erosion. Furthermore, Adapted In-Situ respondents reflect on outcomes mostly in terms of compensation. The reported differentiated compensation between Adapted In-Situ households leads to perceptions of unfairness. Adapted In-Situ interviewees also reflect on outcomes in terms of adaptation to environmental risks and highlight their doubts in terms of the longevity of the adaptation structure.

The criterion of 'equality' is the most commonly used and relevant in the evaluation of outcomes for all three sub-populations. 96% of the Relocated respondents, 72% of the Adapted In-Situ respondents, and 91% of the Non-Adapted respondents agree or strongly agree that the Planned Relocation, Adaptation In-Situ, and Lack of Adaptation, respectively, lead to unequal outcomes (Figure 5.8).

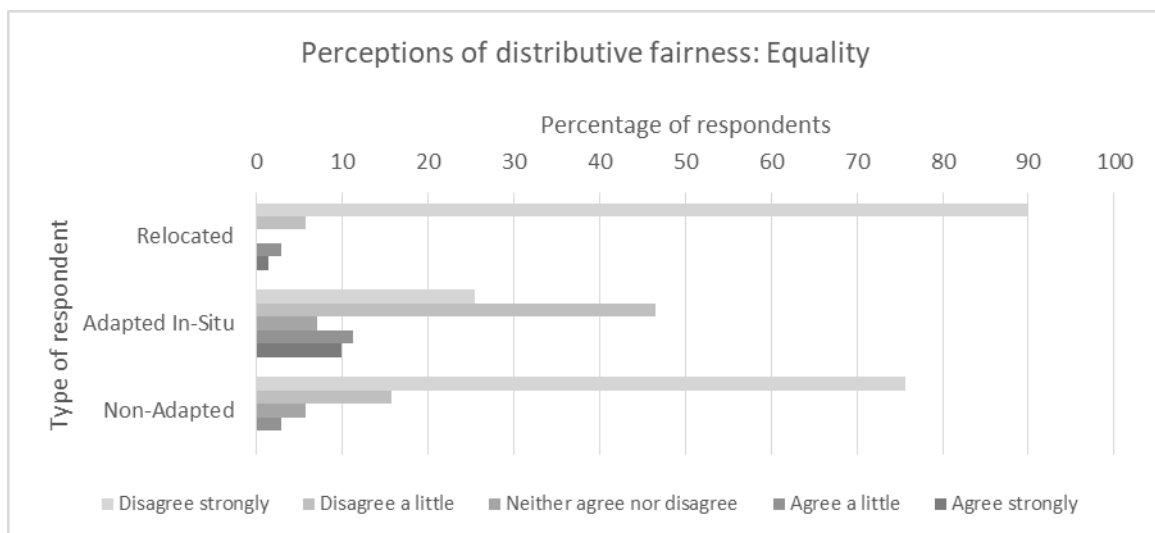


Figure 5.8. A comparison of 'Equality' in Relocated, Adapted In-Situ and Non-Adapted sub-populations.

Relocated and Adapted In-Situ respondents form their perceptions of fairness with regards to the inequality of outcomes. Relocated respondents speak of the

inequality of the Planned Relocation as far as the distribution of benefits such as of plots (in terms of sizes and quality) and housing (in terms of receiving dwellings or not, with ponds or not) are concerned. Adapted In-Situ respondents raise concerns with regards to the inequality of compensation between households of different political affiliations. Whilst these assessments focus on the inequality of outcomes between members of the same sub-population, the assessment of the Non-Adapted respondents focuses on the inequality of outcomes between different sub-populations. Namely, they reflect on the unequal distribution of benefits between themselves, having not been adapted, and the sub-populations that have been adapted.

The most significant differences in opinions are recorded regarding evaluations of distributive matters using the criterion of 'need' (Figure 5.9). 79% of Relocated respondents strongly agree that people who needed it most have been relocated first. In comparison, 83% of Non-Adapted respondents strongly disagree with that same statement that those who needed it most received governmental support. The Adapted In-Situ respondents' opinions differ, with some agreeing or strongly agreeing (25%), and others disagreeing or strongly disagreeing (65%) (Figure 5.9).

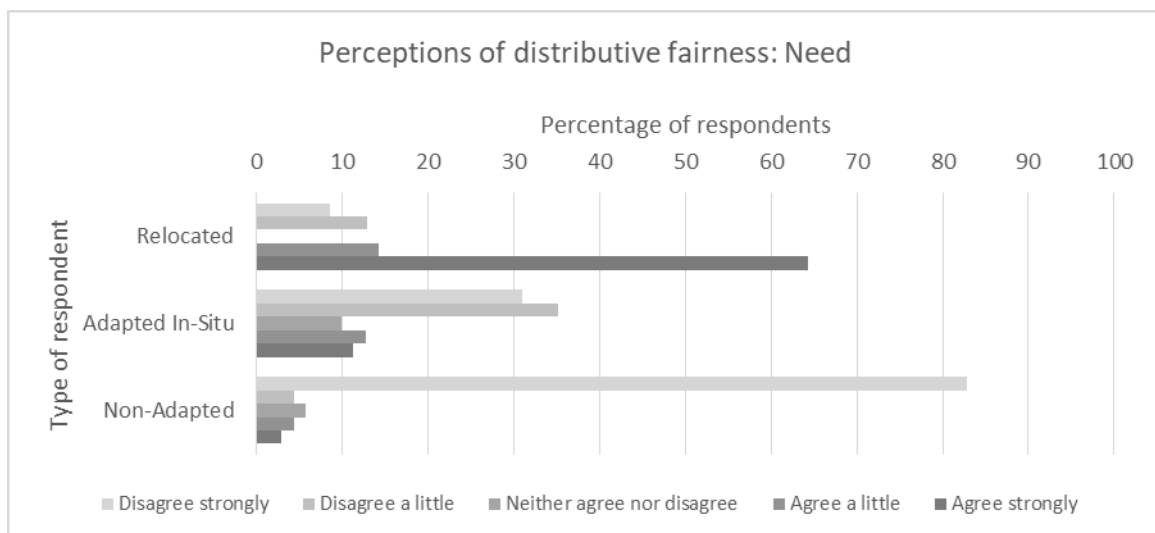


Figure 5.9. A comparison of 'Need' in Relocated, Adapted In-Situ and Non-Adapted sub-populations.

When comparing the mean ranks in a pairwise way between the three sub-populations, statistically significant differences in mean ranks of 'need' scores

between Non-Adapted and Adapted In-Situ ( $p < .0005$ ), Non-Adapted and Relocated ( $p < .0005$ ), and Adapted In-Situ and Relocated ( $p < .0005$ ) are found (Table 5.1).

The assessment of perceptions of fairness in relation to the ‘equity’ of outcomes appears to be relevant only in the assessments of the Adapted In-Situ respondents. This is particularly relevant when respondents assess the outcomes of the Adaptation In-Situ in terms of compensation. Compensation is expected to be received in proportion to losses (in terms of agricultural land and dwellings) due to the construction of the embankment. 69% of Adapted In-Situ respondents report that the distribution of outcomes was equitable (Figure 5.10). However, disputes emerging due to political corruption led to issues of inequality in outcomes. Equity considerations are not relevant for Relocated and Non-Adapted respondents as neither received compensation nor any other form of adaptation benefits in relation to the losses they experienced as a consequence of environmental risks and degradation.

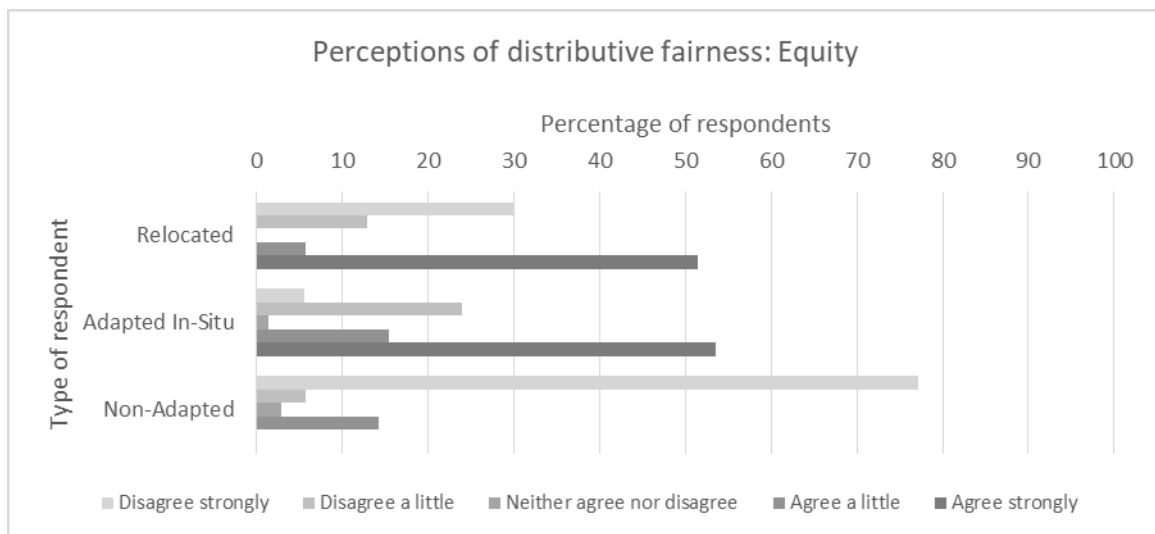


Figure 5.10. A comparison of ‘Equity’ in Relocated, Adapted In-Situ and Non-Adapted sub-populations.

### 5.3.3 A comparison of perceptions of procedural fairness

Procedural fairness appears to be less relevant in the overall assessments of fairness in Planned Relocation, Adaptation In-Situ, and Lack of Adaptation.

Comparisons of variables of procedural fairness have nevertheless produced some interesting results. Relocated and Non-Adapted respondents' perceptions of fairness as far as 'participation' and 'voice' are similar. 96% of Relocated respondents and 93% of Non-Adapted respondents agree or strongly agree that they were able to participate to some extent in some decision-making processes (Figure 5.11). Similarly, 86% and 94% of Relocated and Non-Adapted respondents agree or strongly agree that they were able to express their views and opinions (Figure 5.12).

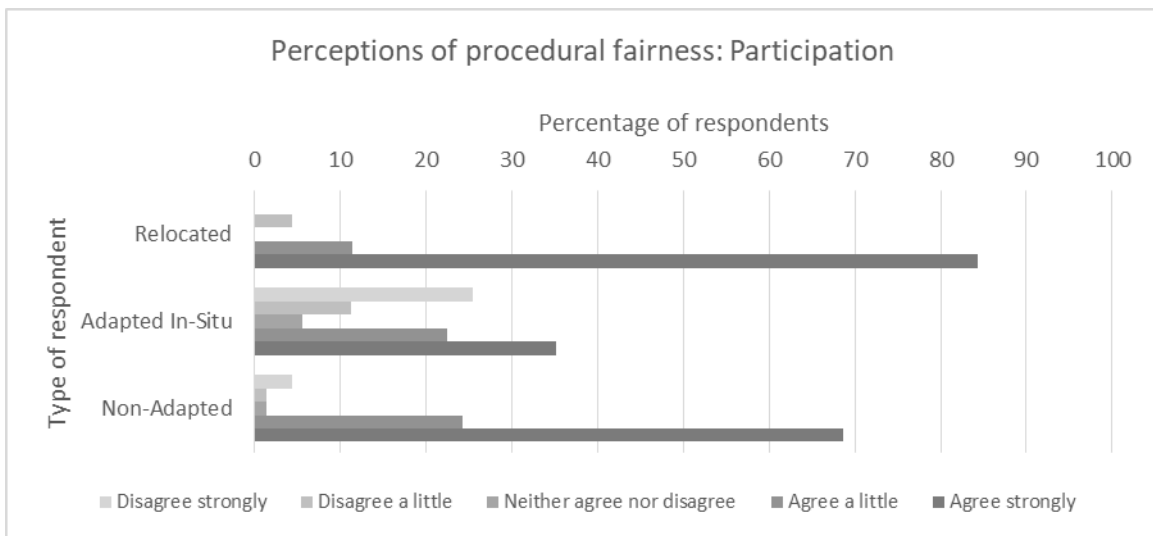


Figure 5.11. A comparison of 'Participation' in Relocated, Adapted In-Situ and Non-Adapted sub-populations.

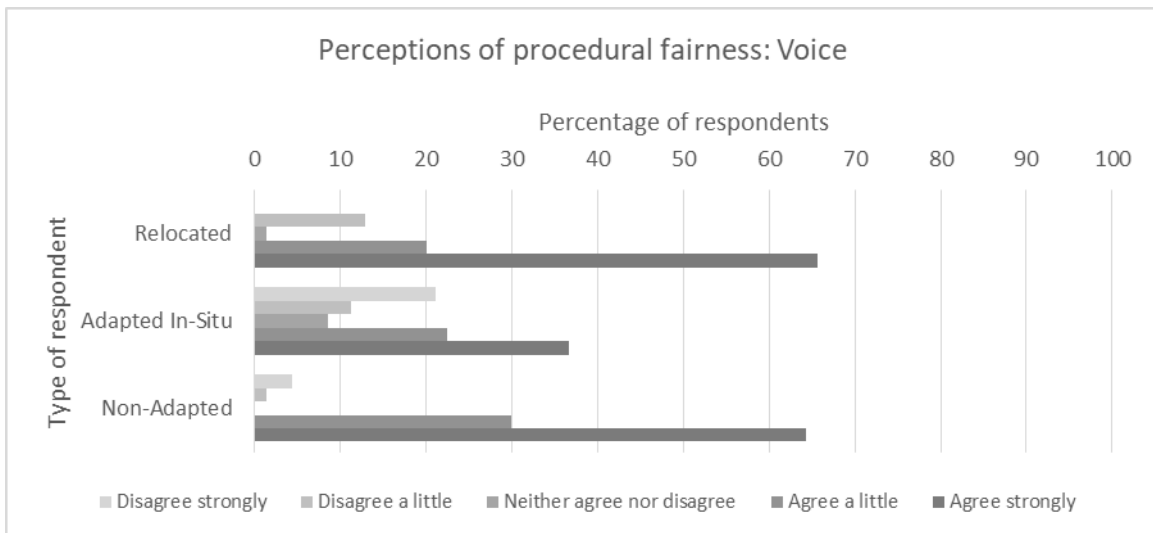


Figure 5.12. A comparison of 'Voice' in Relocated, Adapted In-Situ and Non-Adapted sub-populations.

Their perceptions of their ability to participate and have a voice, however, are not with regards to the actual decision-making processes on whether to relocate or to not adapt. Relocated groups of people were able to select a representative to act on their behalf in the implementation process, specifically in selecting the location of the new settlement. On the other hand, some Non-Adapted individuals were able to participate in meetings with the Panchayat and raise concerns regarding the Lack of Adaptation. Whilst neither of the two sub-populations were able to directly participate in consultation meetings with State government officials that can make decisions on adaptation interventions, they assess their ability to participate and have a voice positively. On the other hand, 58% and 59% of Adapted In-Situ respondents agree or strongly agree on whether they were able to participate and have a voice in the decision-making process, respectively (Figure 5.11 and 5.12). The differences of opinion for both of these procedural aspects are statistically significant between Adapted In-Situ and Non-Adapted ( $p < .0005$ ), and Adapted In-Situ and Relocated ( $p < .0005$ ) sub-populations (Table 5.1).

As far as the criterion of 'consideration' is concerned, the responses of the Relocated and Non-Adapted also show some similarities. 93% of Relocated respondents and 71% of Non-Adapted respondents report that their views were not taken into consideration (Figure 5.13). This is because the opinion of only the first few groups of households relocated to Sagar Island was considered as far as the settlement selection was concerned. The opinions of those Non-Adapted, despite having been shared with the Pradhan and the Panchayat repetitively, have not been taken into consideration by the State government. Despite the similarity in the Relocated and Non-Adapted respondents' perceptions with regards to how much consideration was given to their opinions, their perceptions with regards to 'process control' differ.

86% of Relocated respondents agree or strongly agree that they had a level of process control, whilst 89% of Non-Adapted respondents disagree or strongly disagree to the same statement (Figure 5.14). This divergence of opinions as far



as the ability to control the procedural aspects of adaptation interventions are concerned is emerging regardless of the similarity of opinions on consideration.

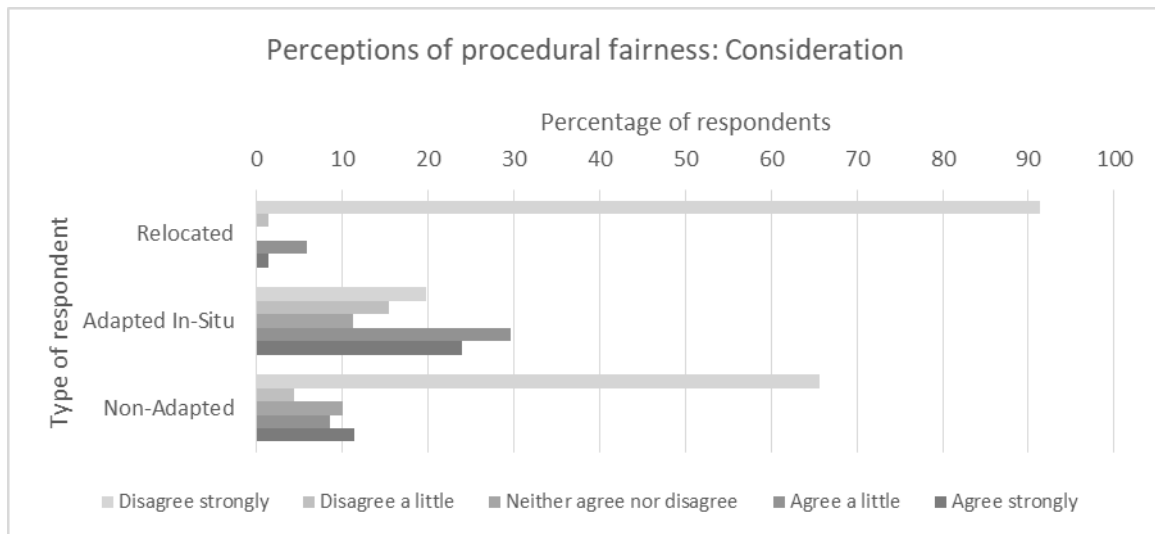


Figure 5.13. A comparison of 'Consideration' in Relocated, Adapted In-Situ and Non-Adapted sub-populations.

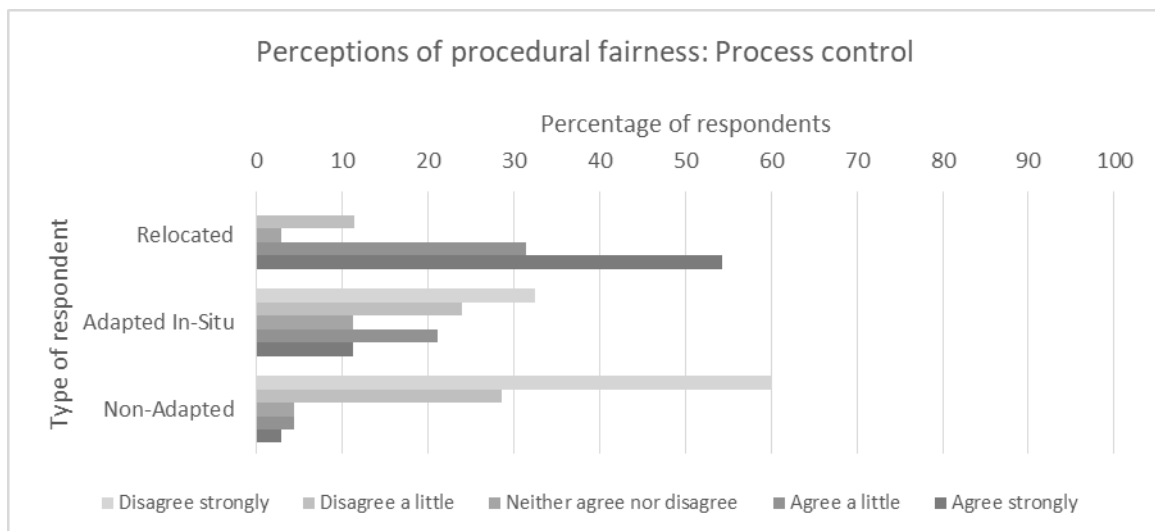


Figure 5.14. A comparison of 'Process control' in Relocated, Adapted In-Situ and Non-Adapted sub-populations.

This is due to the fact that the Relocated individuals, despite not being able to have their opinions taken into consideration, were free to choose whether they wanted to be relocated or not. If they chose to remain on Lohachara Island or Ghoramara Island, the government would not have pressured them to move. On the contrary, the Non-Adapted individuals had no ability to influence the government's adaptation intervention choices. In fact, despite their efforts to ask for government intervention, they have not received any form of adaptation

support to date. The responses of the Adapted In-Situ participants differ from the other two sub-populations as far as both 'consideration' and 'process control' are concerned. Furthermore, perceptions vary between Adapted In-Situ respondents, thus a representative view of the sub-population cannot be established. These differences between the Relocated, Adapted In-Situ, and Non-Adapted respondents' perceptions of consideration and process control are statistically significant between all three sub-populations (Table 5.1).

The findings of this comparative analysis highlight the central role of distributive concerns in the formation of perceptions of fairness in government action and inaction. Most notably, respondents form their perceptions of fairness based on the distribution and incidence of benefits and burdens, the suitability of the adaptation interventions to protect them from environmental risks, the perceived longevity of the intervention, and the impact the intervention has on their livelihoods, and the availability of agricultural land. Concerns that inform the formation of perceptions of fairness in adaptation interventions are of distributive nature. Concerns regarding the procedural aspects of the decision-making processes of adaptation interventions are of most relevance when they directly affect the outcomes. For example, Relocated respondents report that they had no expectation of being involved in the decision-making process on how to be adapted because it 'wasn't their place' and the situation was so severe that they would have accepted whatever form of adaptation the government would have offered them. Respondents' assessments of the fairness of the Planned Relocation are, however, informed by their perceived ability to participate and have a voice in the choice of a location for the new settlement. Nonetheless, this aspect of procedural fairness is referenced only in terms of the impact it ultimately had on outcomes, with those that were able to participate perceiving the outcome as more beneficial and those that were not able to participate perceiving the outcome as less beneficial. This shows that participation in processes informed perceptions of fairness but only when affecting the outcome.

In summary, the results of the comparison of distributive aspects between the three sub-populations shows statistically significant differences between the

responses of the Non-Adapted and the other two sub-populations. Non-Adapted respondents report outcomes to be unfair, regardless of the distributive criterion used to form this judgement. Relocated respondents are satisfied with the outcomes of the Planned Relocation, as opposed to the Adapted In-Situ and Non-Adapted respondents. The criterion of equality is most often used by respondents who believe that government action and inaction lead to unequal outcomes. Relocated respondents speak of inequality between households relocated at different points in time; Adapted In-Situ respondents speak of inequality in compensation which was due to be distributed in an equitable manner (with Adapted In-Situ respondents being the only ones to use the equity criterion in their assessments of distributive fairness); and Non-Adapted respondents speak of inequality of adaptation outcomes across the three sub-populations. When referencing the criterion of need, respondents appear to have the most divergent opinions. Relocated respondents believe that those that needed it most have been relocated first. On the contrary, Non-Adapted respondents disagree that those that needed it most have been adapted first.

As far as the comparative analysis on procedural fairness is concerned, the Adapted In-Situ have mixed opinions with regards to all procedural aspects. Relocated and Non-Adapted respondents have similar perceptions of process-related aspects such as participation, voice, and consideration. Both types of respondents report having had the ability to participate and express their views. However, these accounts are not related to decision-making processes. Relocated respondents report having been able to select a representative to act on their behalf during the Planned Relocation implementation process, specifically in selecting the location of the new settlement. On the other hand, some Non-Adapted individuals report being able to participate in meetings with the Panchayat and raise concerns regarding the Lack of Adaptation. However, despite reports of perceived fairness as far as the criteria of 'participation' and 'voice' are concerned, respondents report perceptions of unfairness as far as the criterion of 'consideration' is concerned. The first groups of Relocated respondents that were able to select the location of their new settlement perceive

having had a level of 'process control' in the implementation of the Planned Relocation.

## **5.4 Summary of findings**

This chapter presents a comprehensive analysis of the dynamic mechanisms surrounding perceptions of fairness formation in Relocated, Adapted In-Situ, and Non-Adapted sub-populations. In doing so, the results respond to the three research questions indicated in the introduction of this chapter. In answering research question 2.1, *'What aspects of fairness are valued by the three unevenly adapted sub-populations?'*, the study develops a theoretically valid and locally relevant list of distributive and procedural fairness criteria. Overall, four criteria of distributive fairness and four criteria of procedural fairness are identified, resonating with studies suggesting that both distributive and procedural perceptions of fairness affect policy acceptance and legitimacy.

In answering research question 2.2, *'How is government action and inaction affecting the perceptions of distributive and procedural fairness of the three unevenly adapted sub-populations?'*, and research question 2.3, *'How do perceptions of fairness compare among the three unevenly adapted sub-populations?'*, the importance of distributive matters is highlighted. Relocated, Adapted In-Situ, and Non-Adapted respondents form their perceptions of fairness in relation to the distribution and incidence of beneficial and adverse outcomes. Results show that the use of distributive fairness criteria such as equity, equality, and need can be dynamic. Respondents employ different criteria when assessing different aspects of government action and inaction, sometimes using multiple criteria contemporarily and other times making trade-offs between different criteria and different situations. Results also show that socially marginalised populations that are exposed to environmental risks and are unevenly adapted have complex perceptions of procedural fairness. The respondents' perceived role in society and their precarious circumstances due to their exposure to environmental risks and limited adaptive capacity are cited as reasons for which

their involvement in decision-making processes is not of particular value to them. They reflect on their urgent need for adaptation and, therefore, explain that they would have accepted any government action that would have improved their circumstances, regardless of process.

However, perceptions of distributive fairness can influence perceptions of procedural fairness and vice versa; for example, one's ability to have a 'voice' in the decision-making process can influence the outcome, as reported by respondents relocated in the first stages of the Planned Relocation from Lohachara Island and Ghoramara Island to Sagar Island. Whilst the quantitative findings presented in this study suggest that participants place more value on outcomes than procedures, the qualitative data reveals the ways that the outcomes are at times shaped by decision-making processes. Although distributive and procedural fairness are separate categories for analytical purposes, and respondents demonstrate that they form perceptions of fairness in relation to different distributive and procedural criteria, there are also complex intertwinements in the formation of perceptions of fairness in the day-to-day.

## **Chapter 6. How perceptions of fairness affect subjective wellbeing in uneven adaptation interventions**

The exposure to environmental risks and the enforcement of government action and inaction in the context of climate change adaptation impact people's wellbeing. Furthermore, uneven government action and inaction impact people's perceptions of fairness. As shown in Chapter 4 and Chapter 5, government action and inaction in the form of Planned Relocation, Adaptation In-Situ, and Lack of Adaptation leads to diverse outcomes as far as wellbeing and perceptions of fairness are concerned. The third aim of this study is to combine these two concepts and investigate if and how perceptions of fairness affect subjective wellbeing. This chapter aims to answer the third research question:

### *3. Do perceptions of fairness influence the wellbeing of unevenly adapted sub-populations?*

The chapter is divided into three sections. The first section presents the results on whether people's assessments of their subjective wellbeing are influenced by their perceptions of how fairly they have been treated in their own experience of government action or inaction. The effects of both perceptions of distributive and procedural fairness are considered. The results show a lack of correlation between perceptions of fairness and subjective wellbeing in Relocated, Adapted In-Situ, and Non-Adapted sub-populations. Thus, the following two sections focus on justifying these negative results.

The second section focuses on the study design and how this may have informed the negative results. It puts forward the argument that perceptions of fairness may not have influenced subjective wellbeing due to a time discrepancy. The study investigates perceptions of fairness with regard to government actions that occurred in the past and correlates such perceptions with subjective wellbeing reported in the present. To support this argument, a timeline of wellbeing fluctuations in Relocated, Adapted In-Situ, and Non-Adapted sub-populations considering a period from before the exposure to environmental risks until the present day is presented. This indicates that relationships between perceptions

of fairness and subjective wellbeing are potentially better investigated in the immediate aftermath of adaptation interventions.

The third section focuses on the context of perceptions of fairness in socially marginalised communities and how these are informed by individuals' expectations of government. It argues that a lack of expectations of procedural fairness can be related to the nature of the local and regional legislative systems in West Bengal and low expectations of government action. This is a novel finding that expands the literature on justice in climate change adaptation governance. It also argues that the Relocated, Adapted In-Situ, and Non-Adapted respondents have low expectations of outcomes and perceptions of pessimistic government intention and capacity as far as climate change adaptation interventions are concerned. This demonstrates that low expectations of government can lead to high levels of perceived distributive justice. The findings on expectations of government and their impact on the formation of perceptions of fairness are used to explain the lack of relationships between perceptions of distributive and procedural fairness and subjective wellbeing.

The results presented in the first section are drawn from the quantitative analysis of the survey (n=222). This allows for a statistical analysis of correlation between perceptions of fairness and subjective wellbeing. The results presented in the second section are drawn from the narrative interviews (n=14). Whilst the aim of these interviews was to explore valued aspects of wellbeing and fairness, their narrative form allowed respondents to reflect on their lives and how they changed over time, shedding light on wellbeing fluctuations over time. The results presented in the third section are drawn from the narrative interviews (n=14) conducted in phase II of the empirical research and the additional semi-structured interviews (n=14) conducted in phase III of the empirical research. Here, the aim is to highlight respondents' expectations of government and whether these may have influenced their formation of perceptions of fairness.

## **6.1 The relationship between perceptions of fairness and wellbeing**

This third part of the study aims to assess whether perceptions of fairness impact subjective wellbeing in the context of government action and inaction in response to environmental risks. Perceptions of fairness are considered in both procedural and distributive terms and thus, the analysis includes four procedural fairness variables (participation, voice, consideration, and process control) and four distributive fairness variables (outcome satisfaction, equity, equality, and need). The eight ordinal indicators used to measure perceptions of fairness range from one to five (1 = disagree strongly; 2 = disagree a little; 3 = neither agree nor disagree; 4 = agree a little; 5 = agree strongly).

As far as the subjective wellbeing criteria are concerned, two variables are used. First, the happiness variable is used as a proxy for subjective wellbeing. Second, an index calculated as the average of ten life satisfaction variables is used to represent subjective wellbeing. The ten ordinal indicators used to measure life satisfaction are: the natural environment, housing, work opportunities, economic security, drinking water, food security, health, children's education, family relations, and community relations. The ordinal indicators for the happiness variable range from one to five (1 = very unhappy; 2 = moderately unhappy; 3 = neither happy nor unhappy; 4 = moderately happy; 5 = very happy). The ordinal indicators for the life satisfaction variables range from one to five (1= very unsatisfied; 2 = moderately unsatisfied; 3 = neither satisfied nor unsatisfied; 4 = moderately satisfied; 5 = very satisfied). For each sub-population (Relocated, Adapted In-Situ, and Non-Adapted) the relationship between each of the eight perceptions of fairness variables and the two subjective wellbeing variables is analysed, for a total of 48 perceptions of fairness – subjective wellbeing relationships.

Two statistical tests are conducted to assess the potential relationship between the two variables of interest. First, an assessment of whether the perceptions of fairness and subjective wellbeing variables have a monotonic relationship is conducted. The term monotonic relationship is a statistical definition that is used



to describe a scenario in which, for example, if the value of the perception of fairness variable increases, then the value of the subjective wellbeing variable increases as well, or if the value of the perception of fairness variable increases, then the value of the subjective wellbeing variable decreases. Neither of the 48 perceptions of fairness – subjective wellbeing pairings show a monotonic relationship.

Second, Spearman's rank-order correlations are conducted to measure the strength and direction of the relationship between the two ordinal variables of interest: perceptions of fairness and subjective wellbeing. The existence of a monotonic relationship between the two variables is an assumption of Spearman's rank-order correlation. Typically, one would not normally want to pursue a Spearman's rank-order correlation to determine the strength and direction of a monotonic relationship when one already knows that the relationship between the two variables is not monotonic. However, Spearman's rank-order correlations are conducted even though the data does not pass the required assumption of monotonicity. This is conducted to confirm the results of the first statistical analysis and ensure there are no methodological errors potentially leading to this result.

The results of all 48 perceptions of fairness – subjective wellbeing correlations are shown in Table 6.1 below, distinguishing between the results of the Relocated (highlighted in blue), Adapted In-Situ (highlighted in green), and Non-Adapted (highlighted in orange) respondents. To interpret the results, it is considered that when the correlation coefficient is closer to '0', the association is weak, and when closer to '+1' or '-1', the association is stronger in a positive or negative way, respectively. The correlation coefficients for the Relocated sub-population vary between  $r_s = -0.390$  and  $r_s = +0.274$  (Table 6.1 A), for the Adapted In-Situ sub-population vary between  $r_s = -0.220$  and  $r_s = +0.249$  (Table 6.1 B), and for the Non-Adapted sub-population vary between  $r_s = -0.134$  and  $r_s = +0.220$  (Table 6.1 C). This shows a lack of correlation between all perceptions of fairness and subjective wellbeing pairings in all three sub-populations.

A		Relocated			
		happiness		life satisfaction index	
		correlation coefficient (r <sub>s</sub> )	statistical significance (p)	correlation coefficient (r <sub>s</sub> )	statistical significance (p)
Procedural fairness	participation	0.126	0.297	0.126	0.304
	voice	0.274	0.022	0.046	0.710
	consideration	0.123	0.311	-0.014	0.910
	process control	0.009	0.939	0.022	0.856
Distributive fairness	outcome satisfaction	0.213	0.077	0.006	0.959
	equity	-0.089	0.466	-0.140	0.252
	equality	0.066	0.587	0.129	0.290
	need	-0.044	0.718	-0.390	0.001
B		Adapted In-Situ			
		happiness		life satisfaction index	
		correlation coefficient (r <sub>s</sub> )	statistical significance (p)	correlation coefficient (r <sub>s</sub> )	statistical significance (p)
Procedural fairness	participation	-0.083	0.491	-0.211	0.078
	voice	-0.039	0.749	-0.220	0.065
	consideration	0.185	0.122	0.011	0.930
	process control	-0.003	0.983	0.194	0.104
Distributive fairness	outcome satisfaction	0.249	0.037	0.230	0.053
	equity	-0.175	0.145	-0.157	0.191
	equality	-0.082	0.496	0.071	0.558
	need	0.011	0.929	0.037	0.761
C		Non-Adapted			
		happiness		life satisfaction index	
		correlation coefficient (r <sub>s</sub> )	statistical significance (p)	correlation coefficient (r <sub>s</sub> )	statistical significance (p)
Procedural fairness	participation	-0.124	0.306	0.101	0.404
	voice	-0.129	0.287	0.137	0.258
	consideration	0.071	0.561	-0.029	0.812
	process control	-0.144	0.235	-0.134	0.269
Distributive fairness	outcome satisfaction	0.208	0.085	0.069	0.570
	equity	0.200	0.097	0.014	0.909
	equality	0.220	0.067	0.052	0.668
	need	0.179	0.138	0.102	0.402

Table 6.1. Correlation coefficients and statistical significance of associations between perceptions of fairness criteria and subjective wellbeing criteria.

Therefore, the answer to the third research question: '*Do perceptions of fairness influence the wellbeing of unevenly adapted sub-populations?*' is no, not in the context of this study. This study finds no evidence that perceptions of distributive and procedural fairness in government action and inaction in the context of environmental risks influence individuals' assessments of subjective wellbeing. These negative results can be interpreted in two ways: as an artefact of the study design or as a reflection of reality. For this study, both of these interpretations are considered to be valid. These arguments are presented respectively in the following two sections.

## **6.2 Lack of correlation between perceptions of fairness and subjective wellbeing as an artefact of the study design**

### **6.2.1 Considerations on the study design**

The lack of associations between perceptions of fairness and wellbeing may be, in part, an artefact of the study design. In this study, perceptions of fairness may not have influenced assessments of subjective wellbeing due to a time discrepancy between the data collected on perceptions of fairness and the data collected on wellbeing. For the purposes of the comparative study, three forms of government action and inaction are considered. However, these uneven forms of adaptation interventions have not all occurred at the same time. The Lack of Adaptation is a present and ongoing issue, whilst the Adaptation In-Situ and the Planned Relocation are actions that occurred in the past. The Adaptation In-Situ took place in the recent past (2015) and the Planned Relocation took place in the distant past (1990s). Despite differences in when these uneven forms of adaptation interventions occurred, the case study of Sagar Island is considered suitable for the purpose of this study. It allows for a comparative investigation of government action and inaction in the context of environmental risks in one geographical area where unevenly adapted sub-populations are similar in terms of exposure to environmental risks, reliance on subsistence agriculture, economic circumstances, social, cultural, religious, and caste background, and

expectations of government. Furthermore, the recall period allows respondents to answer questions on all aspects of the government action and recovery period and reduce the emotional stress associated with the events.

The main dataset on wellbeing considers past and present points in time. All respondents were interrogated on their material, subjective, and relational circumstances at the present time. As far as their wellbeing in the past, Relocated respondents were asked about their circumstances a year before the Planned Relocation, Adapted In-Situ respondents were asked about their circumstances a year before the Adaptation In-Situ, and the Non-Adapted respondents were asked about their circumstances ten years ago. This means that comparisons between a time before the government intervention and the present time allows for comparisons of wellbeing in relation to the government intervention. The assessment of the impact of government interventions on wellbeing in this manner is suitable as those Relocated and Adapted In-Situ have not received any additional support from the government after the Planned Relocation and the Adaptation In-Situ, respectively. The comparison of wellbeing in the Non-Adapted sub-population focuses on a time before the exacerbation of environmental risks (estimated to be ten years ago) and the present time, allowing for a reflection on the deterioration of wellbeing in the case of government inaction. The correlation between perceptions of fairness and subjective wellbeing uses the dataset on present wellbeing.

Relocated, Adapted In-Situ, and Non-Adapted respondents' perceptions of fairness do not affect the way they assess their wellbeing in the present day. While respondents are able to make judgements about how their wellbeing was impacted by government action or inaction (Chapter 4), they do not explain this through the lens of fairness. People appear to make sense of their lives and move on and hence do not dwell on prior misfortunes or perceived slights or exclusion. Hence this study's design somewhat determines the outcome (perceptions of fairness of past adaptation interventions do not seem to affect respondents in the present day). However, this does not explain the lack of correlation between perceptions of fairness and subjective wellbeing in the Non-Adapted sub-

population. This negative result is justified due to the nature of the local and regional legislative systems in West Bengal and low expectations of government action (section 6.3).

### **6.2.2 Fluctuations of wellbeing over time**

The above sections show no correlations between perceptions of fairness of past government interventions and present subjective wellbeing. However, there remains the question of whether correlations between perceptions of fairness and subjective wellbeing in the aftermath of adaptation interventions would have been observed. Results show wellbeing fluctuations over time, between the past (before the adaptation intervention or before the exposure to environmental risks) and the present (see Chapter 4 sections 4.2.2, 4.2.3, and 4.2.4 for the results of this comparison). Considerations on whether wellbeing has fluctuated over time from the government intervention to the present day could also be valuable in understanding when perceptions of fairness have the ability to impact subjective wellbeing. To explore this consideration, an assessment of wellbeing fluctuations over time is presented.

The narrative interviews conducted in phase II of the data collection provided the opportunity for Relocated, Adapted In-Situ, and Non-Adapted participants to narrate their lives and how they changed over time, describing their households and communities, and recounting their experiences of government action and inaction (see Chapter 3 section 3.3.2b for more information on the narrative interviews). Discussions were framed around a broad conception of wellbeing and respondents' personal experience of government action and inaction. The results of the thematic analysis of the narrative interviews shed light on aspects of material, subjective, and relational wellbeing as well as aspects of decision-making processes and outcomes of government action and inaction that the Relocated, Adapted In-Situ, and Non-Adapted respondents value. Furthermore, the narrative format of the interviews allowed respondents to describe their circumstances throughout time, reflect on how their wellbeing changed

throughout their lives, and what may have led to these potential variations in wellbeing.

The results highlight how important aspects of material, subjective, and relational wellbeing change in response to increased or decreased exposure to environmental risks as well as government action and inaction. The thematic analysis of the narrative interviews highlights the aspects of wellbeing that are discussed most often and at length (quantitative analysis), and where the greatest importance is implied (qualitative analysis). These valued aspects of wellbeing inform the choice of wellbeing criteria used to develop the survey and to inform the semi-structured interviews. A number of these aspects are also used to develop a timeline that shows how wellbeing changed over time. The criteria for which most information is available to showcase the variations over time is chosen.

The chosen criteria are categorised as material wellbeing (tenure and size of dwelling; tenure, size, and quality of agricultural land; and livelihoods), subjective wellbeing (satisfaction with the natural environment, satisfaction with food security, and satisfaction with economic security), and relational wellbeing (family relations and community relations). For each sub-population and each period, the wellbeing criteria are shown in either green (if respondents spoke in positive terms), grey (if respondents' opinions varied, with some speaking in slightly positive terms while others in slightly negative terms), or red (if respondents spoke in negative terms). Sections a, b, and c below describe fluctuations in wellbeing in Relocated, Adapted In-Situ, and Non-Adapted sub-populations, respectively.

#### **a) Wellbeing in the Relocated population over time**

The analysis of wellbeing fluctuations over time in the Relocated sub-population leads to the identification of five temporal periods: prior to exposure to environmental risks, during increased exposure to environmental risks, before the Planned Relocation when the exposure to environmental risks was at its highest

point, after the Planned Relocation, and in the present time (Table 6.2). Here, environmental risks are considered in terms of mangrove loss, sea level rise, coastal flooding, storm surges, and cyclones, leading to high rates of coastal erosion and salinity intrusion. Wellbeing is found to fluctuate between these five periods.

Relocated respondents speak of a time before the environmental risks affected their dwellings, agricultural land, and livelihoods. For example, Sahil, a 72-year-old man who lived on Ghoramara Island when he was young, describes the island in positive terms as far as land quality is concerned.

*“Plants [grew] from even just a seed that dropped from one’s hands.”*

	Prior to exposure to environmental risks	During exposure to environmental risks	Before the Planned Relocation	After the Planned Relocation	Present time (2020-2021)
Wellbeing over time in the Relocated sub-population	<b>Material wellbeing</b>				
	<ul style="list-style-type: none"> <li>● Dwelling</li> <li>● Agricultural land</li> <li>● Livelihoods</li> </ul>	<ul style="list-style-type: none"> <li>● Dwelling</li> <li>● Agricultural land</li> <li>● Livelihoods</li> </ul>	<ul style="list-style-type: none"> <li>● Dwelling</li> <li>● Agricultural land</li> <li>● Livelihoods</li> </ul>	<ul style="list-style-type: none"> <li>● Dwelling</li> <li>● Agricultural land</li> <li>● Livelihoods</li> </ul>	<ul style="list-style-type: none"> <li>● Dwelling</li> <li>● Agricultural land</li> <li>● Livelihoods</li> </ul>
	<b>Subjective wellbeing</b>				
	<ul style="list-style-type: none"> <li>● Natural environment</li> <li>● Food security</li> <li>● Economic security</li> </ul>	<ul style="list-style-type: none"> <li>● Natural environment</li> <li>● Food security</li> <li>● Economic security</li> </ul>	<ul style="list-style-type: none"> <li>● Natural environment</li> <li>● Food security</li> <li>● Economic security</li> </ul>	<ul style="list-style-type: none"> <li>● Natural environment</li> <li>● Food security</li> <li>● Economic security</li> </ul>	<ul style="list-style-type: none"> <li>● Natural environment</li> <li>● Food security</li> <li>● Economic security</li> </ul>
	<b>Relational wellbeing</b>				
	<ul style="list-style-type: none"> <li>● Family relations</li> <li>● Community relations</li> </ul>	<ul style="list-style-type: none"> <li>● Family relations</li> <li>● Community relations</li> </ul>	<ul style="list-style-type: none"> <li>● Family relations</li> <li>● Community relations</li> </ul>	<ul style="list-style-type: none"> <li>● Family relations</li> <li>● Community relations</li> </ul>	<ul style="list-style-type: none"> <li>● Family relations</li> <li>● Community relations</li> </ul>

Table 6.2. Wellbeing fluctuations across time in the Relocated sub-population.

Sahil recalls the fertility of the land in positive terms and describes how plants would grow from simply a seed touching the ground. Respondents speak at length about the large plots of land they owned and how fertile these were. The rice crop was so productive that it was reportedly able to sustain a household for an entire year, and the vegetable gardens were so productive that households were able to sell surplus produce at the market. Respondents report that during their youth their parents were able to practice traditional subsistence agriculture, which led to high levels of satisfaction with matters associated with land, livelihoods, food, and economic security. Ansar, a 60-year-old man, recalls that his family was:

*“Good and happy there [on Ghoramara Island].”*

He refers to both the material and subjective wellbeing of his family. The context of his statement reveals that the word ‘good’ is used to refer to the material circumstances, especially to matters related to land, livelihoods, and food security, and the word ‘happy’ is used to refer to the emotional state of his family when living on Ghoramara Island.

There came a time when the coastal inhabitants of Lohachara Island and Ghoramara Island began to experience increasing risks and losses associated with coastal erosion and salinity intrusion. During this period of exposure to environmental risks, respondents were highly dissatisfied with the natural environment. They speak of the impact of environmental risks on their dwellings and agricultural lands, ultimately affecting their livelihoods and food security. Despite these changes, respondents report that social relationships remained intact and that community members came together to help one another in times of need. However, as their exposure to environmental risks increased, their material and subjective wellbeing decreased. Respondents recall that their circumstances were at an all-time low before the Planned Relocation. Marjane, a 45-year-old woman from Ghoramara, recalls:

*“When we were staying in Ghoramara, our house was on the riverbank. Then it gradually started eroding. The water used to hit the walls of the house.”*



Marjane recalls that over time, her family's dwelling was left on the coast of Ghoramara Island and exposed to severe environmental risks. She describes that during storms, 'the water used to hit the walls of the house'. The increasing erosion of agricultural land, until the point where households living on the coastal areas lost all their land, led to interconnected issues with regards to livelihoods and traditional subsistence agriculture, which led to dissatisfaction with food security. Respondents also recall not having the opportunity to diversify their livelihoods, as no jobs were available on Lohachara Island and Ghoramara Island, which led to dissatisfaction with economic security. Some respondents describe living on the streets of Ghoramara Island, sheltering their families under tarpaulins, and struggling to make ends meet by finding occasional daily labour. When the government proposed the Planned Relocation, many respondents report that they had been living in those circumstances for up to a decade. Throughout this time, family and community relations remained strong. Some respondents report a slight decrease in community relations when their material circumstances were at their worse. This was due to a lack of financial means to organise and participate in celebrations as well as a lack of food to share with other community members and socialise.

The material and subjective wellbeing of respondents improved after the Planned Relocation. Here, distinctions can be made between the year after the Planned Relocation and the present time. Shortly after arriving on Sagar Island, respondents report an improvement in their satisfaction with the natural environment. When compared with their circumstances on Lohachara Island and Ghoramara Island, their housing conditions and agricultural land availability also improved. However, many report to have been given small plots of forested land with no dwelling or pond. It took a few years for the Relocated households to build their dwellings, clear their land, and start agricultural production, with little support given by the government during this period. Relocated respondents report that despite initial tensions between the Relocated households and the host communities, relationships of trust and care developed during the first year after the Planned Relocation. Relocated respondents credit the host communities for

giving them daily labour, food, clothing, and help with the construction of their new dwellings.

In time, the circumstances of the Relocated households progressively improved due to the continued upgrading of housing conditions, the ongoing cultivation of crops, and the access to other livelihood options on Sagar Island. In 2020-2021 when this study took place, Relocated respondents report living in suitable dwellings that they own, having a small but productive plot of land, and being able to access diverse livelihood opportunities, ultimately reporting being satisfied with their levels of food and economic security as well as social relations.

In summary, wellbeing fluctuated across time in a downward trend followed by an upward trend. From high levels of wellbeing in the distant past that gradually decreased in parallel with the gradual increase of environmental risks to low levels of wellbeing that progressively improved after the Planned Relocation until the present time. The wellbeing of Relocated respondents is higher in the present time than in the period immediately after the Planned Relocation, despite no additional government interventions have occurred since. With so much time passing between the Planned Relocation and the time of this study, it can be hypothesised that respondents do not relate their perceptions of fairness of an intervention that occurred in the past to their current assessment of their life satisfaction. It can also be hypothesised that if this investigation had taken place in the aftermath of the government intervention, respondents might have assessed their life satisfaction in relation to the potential impacts of the Planned Relocation on their life. Here, respondents may have related potential perceptions of procedural fairness to specific beneficial or adverse outcomes in the aftermath of the Planned Relocation. Furthermore, these perceptions may have informed their assessment of wellbeing. This is particularly relevant as wellbeing in the aftermath of the move to Sagar Island may have been seen by respondents as a direct consequence of the Planned Relocation.

## b) Wellbeing in the Adapted In-Situ population over time

The analysis of wellbeing fluctuations over time in the Adapted In-Situ population leads to the identification of four temporal periods: prior to exposure to environmental risks, during increased exposure to environmental risks, after the Adaptation In-Situ, and in the present time. Here, exposure to environmental risks includes flooding and storm surges due to the breaching of the embankment. Wellbeing fluctuated between these four periods (Table 6.3). It suddenly decreased between the period prior to the exposure to environmental risks (before cyclone Ayla) and the period during the exposure to environmental risks (after cyclone Ayla). Wellbeing then progressively improved again, from after the Adaptation In-Situ until the present time.

	Prior to exposure to environmental risks	During exposure to environmental risks	After the Adaptation In-Situ	Present time (2020-2021)
Wellbeing over time in the Adapted In-Situ sub-population	<b>Material wellbeing</b>			
	<ul style="list-style-type: none"> <li>● Dwelling</li> <li>● Agricultural land</li> <li>● Livelihoods</li> </ul>	<ul style="list-style-type: none"> <li>● Dwelling</li> <li>● Agricultural land</li> <li>● Livelihoods</li> </ul>	<ul style="list-style-type: none"> <li>● Dwelling</li> <li>● Agricultural land</li> <li>● Livelihoods</li> </ul>	<ul style="list-style-type: none"> <li>● Dwelling</li> <li>● Agricultural land</li> <li>● Livelihoods</li> </ul>
	<b>Subjective wellbeing</b>			
	<ul style="list-style-type: none"> <li>● Natural environment</li> <li>● Food security</li> <li>● Economic security</li> </ul>	<ul style="list-style-type: none"> <li>● Natural environment</li> <li>● Food security</li> <li>● Economic security</li> </ul>	<ul style="list-style-type: none"> <li>● Natural environment</li> <li>● Food security</li> <li>● Economic security</li> </ul>	<ul style="list-style-type: none"> <li>● Natural environment</li> <li>● Food security</li> <li>● Economic security</li> </ul>
	<b>Relational wellbeing</b>			
	<ul style="list-style-type: none"> <li>● Family relations</li> <li>● Community relations</li> </ul>	<ul style="list-style-type: none"> <li>● Family relations</li> <li>● Community relations</li> </ul>	<ul style="list-style-type: none"> <li>● Family relations</li> <li>● Community relations</li> </ul>	<ul style="list-style-type: none"> <li>● Family relations</li> <li>● Community relations</li> </ul>

Table 6.3. Wellbeing fluctuations across time in the Adapted In-Situ sub-population

The Adapted In-Situ respondents recall a time when they lived a good life. They describe that the old embankment provided suitable protection for their dwellings and agricultural lands. They were satisfied with their livelihoods and consequently their food and economic security at that time. Community relations thrived. In May 2009, cyclone Aila hit the village of Beguakhali, severely damaging the existing embankment and drastically affecting the circumstances of the villagers. Repeated embankment breaching events since cyclone Aila reduced the embankment's stability, leaving the people of Beguakhali increasingly exposed to environmental risks. In these circumstances, many respondents report having lost their dwellings and agricultural lands. The impact on livelihoods led to a need for livelihood diversification, with many seeking daily labour or migrating to send remittances to their families. Whilst respondents report being slightly dissatisfied with their food and economic security during this period, they continued to report high levels of satisfaction with family and community relations. One key difference in the changes in wellbeing between the Relocated and the Adapted In-Situ sub-populations is the sudden change in circumstances. Relocated respondents report a slow but progressive worsening of reported wellbeing in response to increasing environmental risks prior to the Planned Relocation. Adapted In-Situ respondents report a sudden change in material and subjective wellbeing in the aftermath of cyclone Aila.

In 2015, the government intervened by investing in the construction of a new embankment. After this adaptation intervention, respondents report an improvement in their material and subjective wellbeing, even though not to the same level as before cyclone Ayla. The new embankment provides the necessary protection for dwellings and agricultural lands. However, the government seized the dwellings and lands along the coastal area of Beguakhali as the area was needed for the construction of the new embankment. Households who had to give away their dwellings and all or part of their agricultural lands received compensation. The compensation, however, was below the market value of agricultural land on Sagar Island and uneven amongst households. Respondents report that discrimination in compensation occurred due to political affiliation and corruption. This meant that many of those who gave away their land were not

able to purchase new land elsewhere, which led to issues regarding traditional subsistence agriculture practices and dissatisfaction with food and economic security. Despite the uneven outcomes of the compensation process, respondents do not report issues concerning community relations.

At present, some aspects of material and subjective wellbeing have improved since the time after the Adaptation In-Situ. Whilst many respondents were not able to purchase new agricultural land, they were able to diversify their livelihoods. Households report that some of their members migrated for economic reasons and that the remittances they send are a key contribution to the food and economic security of the household. Respondents, however, remain slightly dissatisfied with the natural environment. They describe that sudden-onset disasters still threaten the village of Beguakhali and that the embankment, whilst able to provide protection in the short term, will not be able to withstand environmental risks in the long term.

In summary, wellbeing fluctuated over time in a downward trend followed by an upward trend, from high levels of wellbeing before the breaching of the original embankment, to low levels of wellbeing after the breaching of the embankment until the construction of the new embankment. After the construction of the new embankment, the wellbeing of the Adapted In-Situ respondents progressively improved. Their wellbeing is higher in the present time than in the period after the Adaptation In-Situ, despite no additional government interventions having occurred since. Similar to the considerations raised in the instance of the Planned Relocation, it can be hypothesised that respondents did not relate their perceptions of fairness of an intervention that occurred in the past to their current assessment of their life satisfaction. It can also be hypothesised that if this investigation had taken place in the aftermath of the government intervention, respondents may have assessed their life satisfaction in relation to the potential impacts that the Adaptation In-Situ had on their life. Here, potential perceptions of fairness may have impacted subjective wellbeing. For example, perceptions of procedural issues surrounding the uneven compensation may have influenced respondents' assessment of their satisfaction with housing or economic security.

### c) Wellbeing in the Non-Adapted population over time

The analysis of wellbeing fluctuations across time in the Non-Adapted sub-population leads to the identification of three temporal periods: prior to exposure to environmental risks, during increased exposure to environmental risks, and in the present time, where exposure to environmental risks is at its highest (Table 6.4). Here, the environmental risks are similar those the Relocated sub-population was exposed to, namely, mangrove loss, sea level rise, coastal flooding, storm surges, and cyclones, leading to high rates of coastal erosion and salinity intrusion. The period between the time prior to exposure to environmental risks and the present time is ten years. Wellbeing fluctuated between these three periods by progressively decreasing in terms of material and subjective aspects, but not in terms of relational aspects.

	Prior to exposure to environmental risks	During exposure to environmental risks	Present time (2020-2021)
Wellbeing over time in the Non-Adapted sub-population	<b>Material wellbeing</b>		
	<ul style="list-style-type: none"> <li>● Dwelling</li> <li>● Agricultural land</li> <li>● Livelihoods</li> </ul>	<ul style="list-style-type: none"> <li>● Dwelling</li> <li>● Agricultural land</li> <li>● Livelihoods</li> </ul>	<ul style="list-style-type: none"> <li>● Dwelling</li> <li>● Agricultural land</li> <li>● Livelihoods</li> </ul>
	<b>Subjective wellbeing</b>		
	<ul style="list-style-type: none"> <li>● Natural environment</li> <li>● Food security</li> <li>● Economic security</li> </ul>	<ul style="list-style-type: none"> <li>● Natural environment</li> <li>● Food security</li> <li>● Economic security</li> </ul>	<ul style="list-style-type: none"> <li>● Natural environment</li> <li>● Food security</li> <li>● Economic security</li> </ul>
	<b>Relational wellbeing</b>		
	<ul style="list-style-type: none"> <li>● Family relations</li> <li>● Community relations</li> </ul>	<ul style="list-style-type: none"> <li>● Family relations</li> <li>● Community relations</li> </ul>	<ul style="list-style-type: none"> <li>● Family relations</li> <li>● Community relations</li> </ul>

Table 6.4. Wellbeing fluctuations across time in the Non-Adapted sub-population.

In time, as the exposure to rapid- and slow-onset environmental risks increased, material and subjective wellbeing levels decreased. Respondents report that the progressive nature of the coastal erosion led to a steady loss of agricultural lands, negatively impacting their livelihoods and, thus, their satisfaction with food and economic security. The loss of land also led to their dwellings becoming exposed to environmental risks. They say that for as long as they had land, they continued to retreat and rebuild their dwellings. Many report having to rebuild their dwellings as many as seven times. The continued coastal erosion accompanied by the retreat of the coastal inhabitants of Dhablat is still taking place today.

In response to this situation, the inhabitants of Dhablat that had the means to migrate have done so, whilst others moved further inland and into other family members' dwellings. However, current coastal inhabitants in Dhablat live in precarious situations. Their dwellings are under constant threat, and their agricultural land has been lost. They live between the sea and one of the main roads of Sagar Island, with no more space for retreating. The Non-Adapted respondents consider themselves trapped, as they have no means to move, and highlight the urgent need for government action.

In summary, wellbeing fluctuated across time in a constant downward trend. From high levels of wellbeing in the distant past that gradually decreased in parallel with the gradual increase of environmental risks until the present time, when an all-time high in terms of exposure to environmental risks and an all-time low in terms of wellbeing is being recorded. The perceptions of fairness investigated in this instance are related to the government inaction that is currently being experienced. Therefore, in the case of the Lack of Adaptation, there is no time discrepancy between when perceptions of fairness are formed and when subjective wellbeing is being assessed. Despite both perceptions of fairness and subjective wellbeing being measured in the present time, no correlations between the two have been found. This negative result is justified due to the nature of the local and regional legislative systems in West Bengal and low expectations of government action. These considerations are explored in detail in the following sections.

## **6.3 Perceptions of fairness in socially marginalised communities**

Whilst the lack of associations between perceptions of fairness and subjective wellbeing could be an artefact of the study design, it is also likely to be a real and robust result. This study shows that perceptions of fairness matter little for populations who may be socially excluded and marginalised in society. The reasons for this finding might be twofold. First, the results presented in Chapter 5 show that Relocated, Adapted In-Situ, and Non-Adapted respondents value procedural matters less than distributive matters. Second, perceptions of fairness can be influenced by people's low expectations of government. The below sections explore these two ideas as a way of explaining the lack of relationship between perceptions of fairness and subjective wellbeing.

### **6.3.1 How local and regional governmental systems on Sagar Island inform perceptions of procedural fairness**

Studies on environmental governance, including planned relocation, show that procedural fairness is of utmost importance to people who benefit or are burdened by environmental interventions (Hamilton, 2018; Schlosberg et al., 2017; Siddiki and Goel, 2017; Resh et al., 2014; Berardo, 2013; MacCoun, 2005; Leach and Sabatier, 2005). When participants consider the decision-making processes to be fair, they are more likely to trust decision-makers (Siddiki and Goel, 2017), accept policy outcomes (Winter and May, 2001), and perceive policies as legitimate (Levi et al., 2009; Adger et al., 2005a). The results of this study are inconsistent with the vast literature on environmental justice that stresses the importance of procedural fairness and the role this plays in people's perceptions. The novel findings of this study show that socially marginalised populations that are exposed to environmental risks and unevenly adapted value distributive outcomes more than procedural fairness.

Relocated, Adapted In-Situ, and Non-Adapted respondents alike express the belief that because of their place in society, it is not their role to have a say in



governmental decision-making processes. They explain that citizens, which they refer to as 'commoners', are not traditionally involved in the decisions taken at the State government level. It is the State government officials that make and implement decisions on adaptation interventions. The villages in Sagar Island, and typically across the rural areas of the region of West Bengal, have local-level leaders. The Panchayat is their traditional village council, with the Pradhan being the village-level leader of the Panchayat. The Pradhan is the point of contact between State government officials and the village community. Specifically, the Pradhan has access to the MLA (Member of the Legislative Assembly) which is the representative of an electoral district to the legislature of the Indian State government. Therefore, within this legislative system, villagers do not have access to the MLA or other State government officials responsible for adaptation interventions. Often, Relocated, Adapted In-Situ, and Non-Adapted respondents report that the Pradhan had meetings with State government officials on their behalf but unbeknown to them.

For example, a Relocated interviewee explains that when he used to live on Ghoramara Island, it was the Pradhan of the village that compiled the list of households that needed to be relocated. At that time, the coastal inhabitants of Ghoramara Island were unaware of the potential Planned Relocation. It appeared that the decision of State level officials to intervene and relocate the households displaced due to coastal erosion was not communicated to such households until the implementation of the adaptation strategy began. Households were only then informed that they were being relocated to Sagar Island. Neither the State officials nor the Pradhan informed people of the imminent Planned Relocation. Sahil, a 72-year-old man relocated from Ghoramara Island, explains his views on this situation.

*“The Pradhan had visited the MLA and had spoken to him [about who needed to be relocated]. But we [the villagers] did not speak to the Pradhan. It all depends on him.”*

Sahil explains that the local community did not have the opportunity to participate in consultation meetings nor express their opinions to the Pradhan, which is their

local leader. He explains that decisions ‘depended on him [the Pradhan]’ and infers his own perceived lack of power in such decision-making processes. When asked directly whether he would have wanted to be involved in the decisions surrounding the Planned Relocation, Sahil said no. He expresses his lack of expectations in terms of participation in consultation meetings even at the local level. When asked whether he thought the outcomes of the Planned Relocation would have been better if locals would have been involved in the decision-making process, Sahil responded no. He does not believe that his involvement could have improved the outcomes. Other Relocated respondents, such as Viraj, a 76-year-old man from Ghoramara Island, speak of the villagers’ ability to participate in decision-making processes in terms of rights. Viraj says:

*"We did not have the right to say anything. You could not approach the Pradhan."*

He says that villagers do not have the right to be involved in government decisions. He explains that villagers cannot approach the Pradhan to express their views on political decisions. The decisions are entirely devolved to the local and State legislative levels. The exclusion of villagers from decision-making processes is also highlighted by the Adapted In-Situ respondents. For example, Purnit, a 30-year-old man from Beguakhali, says:

*"The discussion [to build the embankment] took place with the Panchayat and whatever schedule they had received, it was built accordingly. They [the Panchayat] said, "This is the schedule, see it".*

Purnit, like many other Adapted In-Situ respondents, explains that the decision to build the embankment was communicated by State officials to the Panchayat. The Panchayat then informed the villagers on the final decision and communicated when the embankment will be built (‘the schedule’). The need for the agricultural land of the coastal inhabitants of Beguakhali to make space for the construction of the embankment was also communicated to the villagers. Adapted In-Situ respondents report that they did not have a say in whether they were willing to give away their agricultural lands. For example, Lakshmi, a 60-year-old woman from Beguakhali, says:

*“[The Pradhan] had called us for a meeting and told that the water from [cyclone] Aila had entered our homes. The Aila embankment is being constructed and you all will have to leave your land. They told us that they will give us money.”*

Lakshmi recounts that the Pradhan explained the decision for the construction of the embankment as a form of adaptation intervention to environmental risks, specifically, in response to cyclone Aila. She says that villagers were told they would have to leave their land to make space for the infrastructure development and that compensation for lost lands and dwellings would be given. Similarly to the decision-making and implementation of the Planned Relocation, the Adaptation In-Situ lacked participatory processes.

Non-Adapted respondents agree with the Relocated and Adapted In-Situ respondents as far as their perceived role in governmental decision-making processes. They also express that adaptation interventions and the decisions surrounding such interventions are the responsibility of the State government. However, due to their circumstances in terms of severe exposure to environmental risks and limited adaptive capacity, they attempted to request adaptation interventions. Some respondents report that they tried to approach the MLA directly and express their concerns regarding their exposure to environmental risks and their urgent need for support. These efforts, however, have not influenced the position of the State government. Some Non-Adapted respondents report to having been promised an embankment at a certain point. For example, Prasad, a 60-year-old man from Dhablat, says:

*“[...] before [the] Panchayat election they [the candidates to the Panchayat] just took false measurements [for the construction of an embankment]. The work will be done after the election [they said]. Nothing [has been done]. They make us see the embankment and took our votes.”*

Prasad explains that prior to the latest Panchayat (village council) elections, candidates promised the inhabitants of Dhablat that if they were to be elected, they would ensure an embankment would be built. Prasad describes the land surveys (‘measurements’) that were taken for the construction of the

embankment as 'false'. Since then, the government has not intervened in Dhablat, despite years of exposure to environmental risks and coastal erosion.

In summary, the structure of the local and State level legislative system of West Bengal combined with villagers' understanding of it, their expectations of government decision-making processes, and their perceived role in them led to a lack of perceived importance of procedural matters. The analysis of these circumstances offers an insight into why the inhabitants of Lohachara Island, Ghoramara Island, and Sagar Island have little expectations in terms of procedural fairness. It is uncommon for locals to be involved in State level decision-making processes and, therefore, people have little expectations of it. If people do not expect to be part of processes, they will not perceive their lack of participation in such processes as unfair. People's lack of expectations of participatory processes and, therefore, the lack of perceptions of procedural unfairness, explain why perceptions of fairness have no effect on subjective wellbeing. These findings are distinctive from the extensive environmental justice scholarship that highlights the key role of perceptions of fairness in environmental governance as far as acceptance and legitimacy are concerned (Levi et al., 2009; Tyler, 2006; Adger et al., 2005a).

### **6.3.2 How expectations of government inform perceptions of procedural fairness**

This section sets out to explore individuals' perceptions of government action and inaction in the context of environmental risks in terms of fairness, as well as their expectations of what the government should do and could do. It is arguably the role of government to ensure that society is adapting to the effects of climate change (Porter et al., 2015). The government may take actions such as implementing policies, programmes, and investments to address the impacts of climate change. This is of particular importance as poor and socially marginalised communities may lack the ability to adequately respond to climate change (Adger

et al., 2009; Kates, 2000; Blaikie et al., 1994). However, people's expectations as far as government action is concerned are complex.

People's expectations of government can be influenced by many considerations. For example, past experiences of government inaction can inform current expectations. If governments have not historically intervened to adapt communities to environmental risks, or offer support in the aftermath of natural disasters, or invest in the development of socially marginalised communities, people will expect governments to act in a consistent manner. Chamlee-Wright and Storr (2010) argue that in a post-disaster context, people have expectations of their governments. Government support for environmental risks has historically been low in the islands of Lohachara, Ghoramara, and Sagar. In the aftermath of cyclone Aila (2009) and cyclone Bulbul (2019), the coastal inhabitants of Sagar Island were severely affected, with many experiencing severe damages to their dwellings and crops. However, government post-disaster interventions have been limited. Relocated, Adapted In-Situ, and Non-Adapted respondents report to have received basic provisions (food, water, and tarpaulins) as relief from State officials. This form of post-disaster relief follows the guidelines of the Disaster Management Plan (South 24 Parganas District, 2015). Beyond this initial disaster relief intervention, no additional support was offered.

Examples of government interventions with the stated aim of adapting populations to slow-onset environmental risks, such as coastal erosion, have also been sparse. The only example of Planned Relocation in the local area occurred in the 1980s-1990s. After the change of the State government in 1977, the incoming Communist Party introduced planned relocation policies for the residents of Lohachara Island and Ghoramara Island (Mortreux et al., 2018). The government relocated households to Sagar Island as it was adjacent to Lohachara Island and Ghoramara Island, in the same jurisdiction, and there was land available for planned relocation (Mortreux et al., 2018). The Planned Relocation was enforced as the new Communist party, through the newly elected local self-government of Sagar, Panchayat Samity (1978). Findings from the key informant interviews and document analysis shed light on the motivations behind

the Planned Relocation. Despite being presented to the populations of Lohachara Island and Ghoramara Island as a form of adaptation intervention, the motivations seemed to be political. The newly elected State and local governments aimed to establish their legitimacy and popularity through land reform policies (Löfgren, 2016). The Planned Relocation ended in the 1990s due to the broader economic decline in West Bengal affecting government spending and a lack of available public land on Sagar Island. Since then, despite high rates of coastal erosion, with many households displaced whilst others living in precarious conditions on the coasts of Ghoramara Island and Sagar Island (Dhablat), the government has not implemented any additional planned relocations.

Unlike the case of Ghoramara Island, where displaced households have been relocated, in Beguakhali, the government focused instead on Adaptation In-Situ through long-term investments in coastal protection infrastructure. However, this adaptive infrastructure development was predominantly motivated by the State government's decision to develop a deep-sea port in Beguakhali for the transport of coal and iron ore (Kolkata Port Trust et al., 2018). This development project was considered by the Kolkata Trust Port in 2002, but the decision was not announced publicly until 2010, one year after cyclone Aila (Mortreux et al., 2018). Furthermore, the construction of the embankment did not start until 2015, leaving many displaced individuals in a precarious situation. In the case of the Adaptation In-Situ, similar to the Planned Relocation, the motivation behind the government action did not seem to be driven by climate change adaptation intentions. Instead, it was driven by political and economic motives.

As far as the case of the Non-Adapted sub-population is concerned, Mortreux et al. (2018) argue that the case of Lack of Adaptation in Dhablat is an example of what can happen where there is a lack of incentive for government action. They further contend that the affected population of Dhablat is highly marginalised and has limited capacity to adapt independently or resist government inaction. The marginalised nature of the community could support the case for providing the population with additional government support. However, despite the pressure

the villagers of Dhablat tried to put on the Panchayat and the MLA by asking for government support, no adaptation interventions have so far taken place.

These uneven forms of government action and inaction, as well as people's perceived motivations for government interventions, influence their expectations of government. If people expect the government to do little and not listen to their points of view, then, when the government intervenes, it not only meets their expectations, but it can supersede them. This phenomenon is sometimes explained in terms of the social contract. The social contract is an understanding between civil communities and the State, with such understanding informing the perceived rights and responsibilities of these actors to each other. This ultimately enables governance by consent of the people (O'Brien et al., 2009).

Drawing on the concept of the social contract, the hypothesis put forward here is that perceptions of fairness are informed by individuals' expectations of government intentions and performance. Perceptions of fairness can thus be linked to action and inaction in decision-making processes and outcomes, and to perceptions and expectations of government intentions. For example, if locals have pessimistic expectations of government response, but the actual response is greater than these expectations, then government action can be perceived as fair even in the absence of a participatory approach. Based on the evidence provided here, it can be argued that in contexts where individuals are socially marginalised and lack the ability to adapt to environmental risks, and where historically they have been excluded from decision-making processes and thus lack expectations of government, distributive fairness trumps procedural fairness. This finding is a novel contribution to the literature on environmental justice.

### **6.3.3 How socio-economic and environmental circumstances inform perceptions of distributive fairness**

The results presented in Chapter 5 reveal the particular importance of distributive matters. Relocated, Adapted In-Situ, and Non-Adapted respondents form their

perceptions of fairness in relation to the distribution and incidence of beneficial and adverse outcomes. Respondents hold pluralistic views on distributive matters and make use of distributive fairness criteria (equity, equality, and need) in diverse ways. The results presented in Chapter 5 shed light on how Relocated, Adapted In-Situ, and Non-Adapted respondents employ different fairness criteria when assessing different aspects of government action and inaction, sometimes using multiple criteria contemporarily and other times making trade-offs between different criteria and different situations. Nonetheless, perceptions of distributive fairness have not been found to influence subjective wellbeing.

An in-depth analysis of the semi-structured interviews (n=14) reveals that whilst Relocated, Adapted In-Situ, and Non-Adapted respondents give importance to the outcome of government action and inaction, they do not have specific expectations. Similar to the lack of expectations on procedural matters, Relocated, Adapted In-Situ, and Non-Adapted respondents show a lack of expectations on distributive matters. This can be explained in terms of the historical lack of government support in the context of environmental risks. Whilst government action with the stated aim to adapt locals to the adverse effects of environmental risks has taken place, this study shows that the reasons behind such interventions have been political and economic. Therefore, expectations as far as government intervention outcomes are concerned are low.

Relocated, Adapted In-Situ, and Non-Adapted respondents also explain that considering their socio-economic circumstances and their severe exposure to environmental risks, any improvement in their conditions as a consequence of government action is seen in positive terms. For example, Anusha, a 72-year-old woman from Ghoramara Island, says:

*“We were one island which was gradually vanishing [...] whatever he will do we will happily accept that [...] then we were helpless.”*

Anusha, a Relocated respondent, explains her experience of Ghoramara Island at the time that she was still living there by describing its gradual submergence. She identifies her community and the island as one unit and equates the process



of 'vanishing' of the island to that of its inhabitants. In these circumstances, she describes the inhabitants of the coastal areas of Ghoramara Island as 'helpless'. Throughout the interview Anusha explains that she and her community did not have the ability to move elsewhere or to adapt to the increasing risks associated with the exposure to coastal erosion, therefore, she was 'happy' to accept 'whatever' support the government would offer. This shows a lack of expectation as far as specific adaptation outcomes are concerned. It also demonstrates that when individuals find themselves in situations where they cannot adapt and consider themselves 'helpless', they are more willing to accept adaptation measures. These views are echoed by Adapted In-Situ and Non-Adapted respondents. For example, Sumana, a 79-year-old Adapted In-Situ woman, says:

*"We are depending upon survival."*

Sumana explains that she and her community depended on government action for 'survival'. She argues that considering the community's circumstances in terms of their severe exposure to environmental risks in the aftermath of the embankment breaches and their limited capacity to adapt by themselves, the outcomes of the adaptation interventions were of sole and utmost importance. However, she does not report particular expectations as to what the outcomes should be. Similarly, Non-Adapted respondents also speak of government action as a need to 'survive'. For example, Prasad, a 60-year-old man from Dhablat, says:

*"Make the embankment! Let people survive!"*

Prasad expresses expectations as far as government action is concerned in terms of the construction of an embankment. He sees this as a need for the inhabitants of Dhablat to be able to 'survive'. In his interview, he also expresses the government's inaction in terms of pessimistic intent, meaning that he believes that the government is able to help but has no intention to do so (Chamlee-Wright and Storr, 2010). Prasad explains his views on the government's pessimistic intent as follows:

*“All the funds for the land acquisition for the construction of the Aila embankment, the money given by the State government, all that money has been looted. All the [local] politicians [have looted]. Bricks, cement have been sold so the work [on the construction of the embankment] has been stopped. Those who were responsible for the work, they left the work and went away.”*

Prasad, like other Non-Adapted respondents, believes that the embankment that was built in Beguakhali was supposed to continue South so that the village of Dhablat would also be protected. He recalls that local leaders had informed the community about this possible adaptation intervention. However, he states that members of the Panchayat had ‘looted’ the funds allocated by the State government for the construction of the embankment. This demonstrates his views of the government in terms of pessimistic intent but optimistic capacity (Chamlee-Wright and Storr, 2010). This means that some Non-Adapted respondents believe that the government has the ability to help but has no intention to do so. On the contrary, other Non-Adapted respondents exhibit views of optimistic intent but pessimistic capacity (Chamlee-Wright and Storr, 2010). This means that they believe the government wants to help but is not able to do so. For example, Amar, a 60-year-old Non-Adapted man from Dhablat, says:

*“They [the government] could not give land to everyone.”*

Amar refers to the adaptation of the inhabitants of Lohachara Island and the coastal inhabitants of Ghoramara Island through Planned Relocation. He expresses his lack of expectations as far as a potential Planned Relocation in Dhablat is concerned because he believes the government cannot give land to everyone. This demonstrates his perceptions of the pessimistic capacity of the government. Shyla, a 40-year-old woman from Dhablat, has similar views:

*“What will they [the government] do? See, everyone is economically poor here, so who will they give, and who will they leave out?”*

She argues that the inhabitants of Sagar Island are poor and have no means of adapting, which means that the government would eventually have to support all coastal inhabitants. She reflects on this situation by wondering ‘what will the government do?’. She further reflects on how the government can make

decisions in terms of who to adapt and who not to adapt. Shyla's response also highlights that perceptions of pessimistic capacity are common in the Non-Adapted sub-population. Drawing on the concept of perceptions of pessimistic and optimistic government intent and capacity in reference to climate change adaptation, the hypothesis put forward here is that perceptions of fairness are also informed by perceptions of government intent and capacity. People's views on government intent and capacity affect their expectations of government and, in turn, their perceptions of distributive fairness.

In summary, Relocated, Adapted In-Situ, and Non-Adapted respondents show that despite valuing distributive matters more than procedural matters as far as government adaptation interventions are concerned, they do not have high expectations of outcome. They often describe the need for government action in terms of survival and highlight their lack of ability to adapt otherwise. Chapter 5 shows that Relocated, Adapted In-Situ, and Non-Adapted respondents form perceptions of distributive fairness by assessing the outcomes in terms of satisfaction with overall outcomes, and the distribution of such outcomes based on equity, equality, or need criteria. Chapter 5 also argues that satisfaction with the overall outcomes of government action and inaction is the most important criterion used in assessing the fairness of outcomes. However, due to a lack of expectations as far as distributive matters are concerned, and a need for government intervention, there are no associations between perceptions of distributive fairness and subjective wellbeing.

#### **6.4 A summary of findings**

In answering the third research question '*Do perceptions of fairness influence the wellbeing of unevenly adapted sub-populations?*', this chapter argues that no correlations exist between Relocated, Adapted In-Situ, and Non-Adapted respondents' perceptions of fairness and their assessments of subjective wellbeing. The chapter presents statistical analysis supporting the argument that neither perceptions of procedural nor distributive fairness have an effect on

subjective wellbeing in any of the three sub-populations. It proceeds by interpreting these negative results in two ways.

First, it argues that the study design, with perceptions of fairness being investigated in the past – as far as the Planned Relocation and the Adaptation In-Situ are concerned – and subjective wellbeing being investigated in the present, may explain these negative results. To investigate this hypothesis an analysis of wellbeing over time, from before the exposure to environmental risks until the present day has been presented for the Relocated, Adapted In-Situ, and Non-Adapted sub-populations. This shows that wellbeing fluctuated over time, with wellbeing conditions worsening due to the exacerbation of environmental risks, and then improving due to the outcomes of government interventions such as Planned Relocation and Adaptation In-Situ. A continued decrease in wellbeing in the Non-Adapted sub-population is reported.

Second, it argues that a lack of expectations of procedural fairness, due to the nature of the local and regional legislative systems combined with low expectations of government action, leads to a lack of particular importance given to participatory processes. The chapter puts forward the idea that contrary to established views in environmental governance and justice, in this study, distributive fairness trumps procedural fairness. This finding is also used to explain the lack of relationships between perceptions of procedural fairness and subjective wellbeing. In discussing the importance given by Relocated, Adapted In-Situ, and Non-Adapted respondents to distributive fairness, the chapter highlights low expectations of outcomes and complex perceptions of government capacity and intent in terms of climate change adaptation. This demonstrates that low expectations can explain high levels of perceived distributive justice. This finding is also used to explain the lack of relationships between perceptions of distributive fairness and subjective wellbeing.

## **Chapter 7. Discussion**

This chapter aims to bring together the theoretical and empirical work presented throughout this thesis. It starts by summarising the results of this study. These findings are then discussed in relation to the theoretical and conceptual framework presented in Chapter 2. This evaluation addresses whether the results of this thesis confirm, contradict, or expand the existing literature on wellbeing and fairness in environmental governance. Throughout this discussion, the novelty of findings and their contribution to established knowledge gaps are highlighted.

The robustness of the results is then assessed in relation to the strengths and weaknesses of the chosen methods and their use in other similar empirical studies. The policy implications of these results as far as the adaptation of vulnerable and socially marginalised populations to environmental risks are described. Furthermore, specific policy recommendations on planned relocation policy are presented.

### **7.1 Summary of empirical results**

The empirical output of this thesis is presented in three parts, with Chapter 4, Chapter 5, and Chapter 6 focusing on results on wellbeing, perceptions of fairness, and relations between perceptions of fairness and wellbeing respectively.

Chapter 4 presents an analysis of multidimensional wellbeing in Relocated, Adapted In-Situ, and Non-Adapted sub-populations, accounting for material, subjective, and relational wellbeing. It provides two comparisons of wellbeing, one across time and one across space. First, within sub-population comparisons between past and present life circumstances highlight the impact of government action and inaction on wellbeing. Second, between sub-populations comparisons of present life circumstances assess which sub-population is better off in terms of wellbeing. The within sub-population comparisons show that: (i) the Planned

Relocation led to an improvement in material wellbeing (farmland tenure, dwelling tenure, and quality of housing) and subjective wellbeing (life satisfaction), and to a dual form of relational wellbeing, with Relocated respondents reporting social attachments to both Ghoramara Island and Sagar Island; (ii) the Adaptation In-Situ led to a slight amelioration in material wellbeing (housing quality) and subjective wellbeing (happiness and satisfaction with housing), but overall had no impact on other material, subjective, or relational wellbeing aspects; and (iii) the Lack of Adaptation led to negative repercussions on material wellbeing (loss of farmland and traditional livelihoods) and subjective wellbeing (life satisfaction with the natural environment, work opportunities, economic security, food security, and housing), but not on relational wellbeing.

The comparison between Relocated, Adapted In-Situ, and Non-Adapted sub-populations shows that as far as material wellbeing is concerned, the Adapted In-Situ individuals have the highest monthly income levels derived from secure types of employment with the least reliance on remittances, whilst the Relocated individuals are the most likely to own farmland and practice traditional subsistence agriculture. The Non-Adapted individuals are the worst off both in terms of monthly income levels (relying most heavily on remittances) and farmland tenure. Relocated respondents report the highest levels of subjective wellbeing across six out of ten life satisfaction domains. Respondents from all three sub-populations perceive themselves in similar ways, as relational and communal selves.

Chapter 5 presents first, an analysis of Relocated, Adapted In-Situ, and Non-Adapted respondents' perceptions of distributive and procedural fairness in relation to the Planned Relocation, Adaptation In-Situ, and Lack of Adaptation, respectively; and second, a comparison of perceptions of fairness across the three sub-populations. Results show that all three types of respondents form their perceptions of fairness in relation to the distribution and incidence of beneficial and adverse outcomes of government action and inaction. Despite presenting pluralistic views on distributive matters when assessing outcomes in terms of equity, equality, and need, the most valued distributive aspect appears to be the

overall outcome. As far as procedural fairness is concerned, results suggest that Relocated, Adapted In-Situ, and Non-Adapted respondents do not value procedural fairness very highly. Their role in society, precarious circumstances due to the exposure to environmental risks, and lack of adaptive capacity are cited as reasons for which their involvement in decision-making processes is not of particular significance to them.

Results on perceptions of distributive fairness show statistically significant differences between the responses of the Non-Adapted and the other two sub-populations. Non-Adapted respondents report outcomes to be unfair, regardless of the distributive criteria used to form this judgement. Relocated respondents are satisfied with the outcomes of the Planned Relocation, as opposed to the Adapted In-Situ and Non-Adapted respondents. The criterion of equality is the most commonly used, whilst the criterion of equity is only used by Adapted In-Situ respondents. The criterion of need is used by all three types of respondents, with those Relocated and Adapted In-Situ using it in assessing the distribution of outcomes within their sub-population, whilst those Non-Adapted using it in assessing the distribution of outcomes across different sub-populations. Results on perceptions of procedural justice are mixed for the Adapted In-Situ respondents. Relocated and Non-Adapted respondents have similar perceptions as far as participation, voice, and consideration are concerned, but different opinions in terms of process control. Their views, however, are mostly formed in relation to the implementation of the Planned Relocation or in relation to discussions held at the local level, and not specifically related to government action or inaction decision-making processes.

Chapter 6 presents evidence that perceptions of fairness do not influence Relocated, Adapted In-Situ, and Non-Adapted respondents' assessments of subjective wellbeing. A two-part interpretation of this negative result is presented. First, the study design, with perceptions of fairness being investigated in the past and subjective wellbeing being investigated in the present, is considered a potential reason for the lack of correlations. To investigate this hypothesis an analysis of wellbeing over time, from before the exposure to environmental risks

until the present day is presented for the three sub-populations. Second, the argument that a lack of expectations of procedural fairness due to the nature of the local and regional legislative systems, combined with low expectations of government action, can explain the lack of importance given to participatory processes is put forward. This, consequently, does not affect personal assessments of subjective wellbeing. In this context, distributive fairness has been found to trump procedural fairness. Nonetheless, the combination of low expectations of outcomes and perceptions of pessimistic government intent and capacity regarding government action may have led to high levels of perceptions of distributive justice. Due to low expectations of outcomes, government action is perceived as meeting expectations and government inaction is justified, ultimately resulting in little or no effect on subjective wellbeing evaluations. Overall, this chapter presents novel insights which reveal the finer nuances of the interaction between respondents' personal life circumstances, the broader social, cultural, and political context, and uneven adaptation interventions, and how these dynamic mechanisms influence the formation of perceptions of fairness.

## **7.2 An evaluation of results in light of existing knowledge**

### **7.2.1 Improved livelihoods as a key to successful planned relocation**

The importance of livelihoods is identified in the literature on planned relocations. For example, Piggott-McKelle et al. (2019) highlight the importance of the ability to rebuild livelihoods in the new location. Arnall et al. (2013a) demonstrate that the ability to secure a viable livelihood is a key determinant in whether relocated individuals remain in the new location or return to their places of origin despite their exposure to environmental risks. The results of this study corroborate these claims.

During the initial stage of the study, aspects of wellbeing that are valued by the unevenly adapted sub-populations, including Relocated sub-populations, have been identified. Here, the matter of livelihoods is raised as the most pressing concern across all three sub-populations: Relocated, Adapted In-Situ, and Non-



Adapted. Livelihoods are discussed as key for material wellbeing but also contributing to the formation of assessments of life satisfaction. The sub-populations report having historically relied on subsistence agriculture and speak of agricultural land tenure as an issue of utmost importance. They discuss at length the negative repercussions that their exposure to environmental risks such as coastal erosion and salinity intrusion has on the size and quality of agricultural lands.

The comparison of wellbeing over time, which assesses the wellbeing of Relocated respondents before and after the Planned Relocation, shows an improvement in livelihoods. The key factor in this improvement is the availability of agricultural land. 99% of respondents report having had no agricultural land left on Lohachara Island or Ghoramara Island before the Planned Relocation, despite having historically had many Bighas of land. A Relocated respondent describes that the process of losing the agricultural land, and consequently their means for subsistence, made them feel like they were 'waiting their turn on the butcher's block'. Before the Planned Relocation no survey respondent flagged crop farming as either their primary, secondary, or tertiary livelihood. Daily labour is flagged by 49% as a primary livelihood and by 28% as a secondary livelihood, whilst fishing is flagged by 45% as a primary livelihood and 13% as a secondary livelihood.

As part of the Planned Relocation, households received plots of land on Sagar Island. The Planned Relocation took place from 1977 until the mid-1990s, with households being progressively moved. The initial Relocated households received larger plots of land, dwellings, and ponds and were moved away from the coastal areas of Sagar Island. In time, Relocated households received increasingly less land, often forested and saline, and no house or pond, and were moved to settlements located on the coastal areas of Sagar Island. 73% of respondents report having agricultural land, with 15% having 1.5 Bigha, 27% having 1 Bigha, and 12% having 0.5 Bigha. Relocated respondents that received land report high levels of satisfaction with work opportunities. They describe that the renewed ability to practice subsistence agriculture improved their material

conditions. Those with smaller plots express that whilst the plots are not big enough to produce enough food to sustain their families, they consider the ability of having them as a significant improvement compared to their circumstances before the Planned Relocation. The 27% of respondents that were not given agricultural land as part of the relocation process, whilst recognising the inequality among Relocated households, do not perceive the Planned Relocation as having a negative effect on their material wellbeing. They often make downward comparisons against the circumstances of households that are still living on Ghoramara Island or against their circumstances prior to the Planned Relocation and conclude that their material circumstances have overall improved due to the Planned Relocation.

This study confirms existing empirical evidence that highlights the importance of livelihood restoration in planned relocation, especially for populations that are reliant on subsistence agriculture (Arnall et al., 2013a; Badri et al., 2006; Ngenyam Bang and Few, 2012; Oliver-Smith, 2009; Timms, 2011). This study expands this understanding by presenting a case study where livelihoods have improved as a consequence of planned relocation. Whilst studies conclude that planned relocation can result in a decrease in land size (Hang Bui and Schreinemachers, 2011), quality of land (Piggott-McKellar et al., 2020), or even landlessness (Lai Ming and Saumik, 2013; Sati and Vangchhia, 2017), the relocation of populations studied here led to an increase in available productive land. Relocated households went from being landless to the majority of them owning plots of land. This allowed relocated households to return to the practice of traditional subsistence agriculture, or at least to be able to farm some of their food. This in turn led to increased economic and food security. These results show that when planned relocation improves livelihoods, it is perceived by those experiencing it as a successful adaptation intervention. Furthermore, this example shows that if planned relocation addresses key aspects that are valued by the relocated populations, such as the availability of productive farmland for those traditionally relying on subsistence agriculture, it has the potential to enhance their development. In this case, the planned relocation does not only

reduce the relocated populations' exposure to environmental risks, but it also improves their quality of life.

### **7.2.2 Successful planned relocation: beyond the matter of livelihoods**

In the aftermath of planned relocation, this study found other aspects of material, subjective, and relational wellbeing to be important. On Sagar Island, Relocated respondents report being homeless before the government intervention. Furthermore, some report that whilst living on the coastal areas of Lohachara Island and Ghoramara Island they were constantly exposed to environmental risks. Post Planned Relocation, results show an improvement in dwelling tenure (99% of respondents own their own dwelling now compared to 10% in the past). Those that had a dwelling prior to the Planned Relocation report post Planned Relocation improvements as far as roofing (94% of respondents having brick or tiles roofing today compared to 74% and 19% of respondents having hay and polythene roofing in the past) and access to sanitation (93% of respondents having access to sanitation facilities today compared to 99% of respondents having no access to sanitation in the past) are concerned. These results corroborate existing empirical findings that show that in the aftermath of planned relocations improvements are often reported regarding housing size and safety (Wang and Wall, 2007), and access to services and public infrastructure (Mteki et al., 2017).

The results on subjective wellbeing show a statistically significant improvement in happiness, satisfaction with the natural environment, satisfaction with work opportunities, satisfaction with economic and food security, and satisfaction with housing conditions. For example, 74% of participants report a statistically significant increase in happiness from before the Planned Relocation to the time of the study. Two main reasons are identified behind these improvements.

First, the reduced exposure to environmental risks. Relocated households were severely exposed to environmental risks such as coastal erosion and recurrent

storms prior to the Planned Relocation. The new settlements on Sagar Island offer better protection from environmental risks. Those that relocated to Gangasagar and Kamalpur live inland, whilst those that relocated to the coastal settlement of Bankimnagar are yet again exposed to environmental risks. These relocated households, however, whilst they are exposed to storms and rapid-onset disasters, they do not experience coastal erosion. Second, the transition from landlessness to having small plots of farmland positively affected many non-material wellbeing aspects, especially respondents' satisfaction with food and economic security. Respondents report that their life circumstances are not as good as they were before the coastal erosion took away their farmlands and dwellings on Lohachara Island and Ghoramara Island, but that they have experienced an improvement from their life circumstances before the Planned Relocation.

Relational aspects of wellbeing are also highlighted as important and to some extent reliant on livelihoods. The availability of food allows relocated communities to be able to socialise and share meals with extended family members and friends. For example, questions about happiness led to answers about economic security, with 'having enough' being described as being able to share with others and being with others as a reason for happiness. An increase in food availability was also found to improve aspects of community living, with community members being able to help and rely on each other. This demonstrates the interconnectedness of material, subjective, and relational aspects in people's assessments of their lives.

### **7.2.3 The importance of livelihood considerations in government action and inaction**

The importance of livelihoods, and particularly the availability of agricultural land for subsistence agriculture, is not only evident in Planned Relocation, but also in the case studies on Adaptation In-Situ and Lack of Adaptation. The issue of livelihoods related to the availability of agricultural land is highlighted by Adapted

In-Situ and Non-Adapted respondents alike. The Adapted In-Situ population lost their land due to coastal erosion followed by the need to give away their lands to make space for the construction of the embankment. The issue of loss of land, combined with the unequal treatment in compensation processes and a lack of ability to afford to purchase new plots of land led to perceptions of unfairness among Adapted In-Situ interviewees. As a result, 55% of the Adapted In-Situ respondents report being landless. It is important to note, however, that Adapted In-Situ respondents that lived in closer proximity to the embankment experienced more negative repercussions in terms of livelihoods in comparison to Adapted In-Situ respondents that lived further inland. These latter respondents report that the embankment has improved their livelihoods as it has offered protection for their agricultural lands. They also report experiencing less flooding.

Similarly, the Non-Adapted population reports that over the past ten years they have progressively lost their agricultural lands. Whilst ten years ago Non-Adapted respondents report having plots that ranged between 2 and 25 Bighas, at the time of the study, 56% of respondents report having no land, with 96% of the remaining respondents reporting having only up to 3 Bigha. The inability to produce food severely affects the wellbeing of Non-Adapted respondents. Results show a statistically significant decrease in satisfaction with work opportunities as well as satisfaction with economic and food security. When comparing the material wellbeing of Relocated, Adapted In-Situ, and Non-Adapted populations, results show that only 29% of Relocated respondents are currently landless.

These results show that in the case of Sagar Island, the Planned Relocation led to a significant improvement in livelihoods due to the endowment of agricultural land as part of the government intervention. The Planned Relocation led to better material and subjective wellbeing outcomes than the Adaptation In-situ. This demonstrates the central importance of livelihood restoration and protection in the context of climate change adaptation, whether this is undertaken in-situ or consists in the movement of people.

#### **7.2.4 A case where distributive justice trumps procedural justice: the role of expectations**

The theorisation of justice in local climate change adaptation contexts has predominantly focused on distributive and procedural aspects (Adger et al., 2006). The significance of participatory decision-making processes has been outlined by researchers (Correa et al., 2011; de Sherbinin et al., 2011a; Ferris, 2015; Kingston and Marino, 2010; McAdam and Ferris, 2015; McNamara and des Combes; 2015). In the case of planned relocation, Piggot-McKellar et al. (2019) show that participation in decision-making is the primary concern of relocated individuals.

This study's findings on perceptions of procedural justice show that the majority of Relocated respondents strongly agree with statements that they had the ability to participate in decision-making processes (84%), have a say (66%), and have a level of control over processes (54%). However, interviews with Relocated participants put these findings into context. It appears that the decision on whether the Planned Relocation would be a suitable and desirable form of adaptation was not discussed with the local communities. They were not informed of the intentions of the government to act nor were they able to express their opinions on such matters. The State government took such decisions and liaised with the Pradhan (village-level leader) to compile a list of individuals that were most urgently in need of adaptation.

Therefore, it transpires that Relocated respondents form their perceptions of procedural fairness not based on their ability to participate in the decision-making process on whether to relocate but based on their ability to participate in the implementation process, by choosing the preferred location to be relocated to. Respondents explain that they were asked by the Pradhan to select a representative to visit Sagar Island, visit different potential settlement locations, and choose a preferred one. This made them feel like they were able to 'participate' and have a 'voice'. The Planned Relocation was an ongoing programme that lasted over a decade, with households of people continuously being moved to Sagar Island. During this time, the households that were

relocated in the initial stages had the ability to select their preferred location. But as the available land on Sagar Island started to run out, those relocated in the last stages were left with no choice other than to move to the remaining sites.

Despite little involvement by Relocated respondents in the decision-making and implementation process of the Planned Relocation, they appear to have perceived the procedures as rather fair overall. Three explanations for these results have been identified. First, the local and regional governmental system in West Bengal does not typically include citizens in decision-making processes and, therefore, people have no expectations as far as participating in discussions on planned relocation or other adaptation strategies. Relocated interviewees report that, as 'commoners', they do not have a say in such matters. This finding is in line with the literature on how expectations are shaped by wider structural processes and conditions, namely that people's expectations of future government action are informed by their previous experiences with the government (Miller and Listhaug, 1999; Sloane, 1991). Second, participants describe their circumstances prior to the Planned Relocation in terms of helplessness and see the intervention of the government as an opportunity for survival. They, therefore, have no expectations as far as procedures are concerned. Some even say that they had no expectations as far as outcomes were concerned and reflected on this by saying that they would have accepted whatever support they would have been offered.

Third, respondents have predominantly pessimistic expectations of government intent and capacity. Non-Adapted respondents report that they do not believe the State government has an interest in adapting the socially marginalised communities on Sagar Island. They describe the adaptation interventions that took place on Sagar Island, such as the Planned Relocation and the Adaptation In-Situ, as political and economic interventions. Whilst they both reduced the exposure of populations to environmental risks and led to development outcomes, such as increased material and subjective wellbeing aspects, the reasons behind the interventions are not cited as climate change adaptation responses. In the case of the Planned Relocation, the newly elected State and

local governments were aiming to establish their legitimacy and popularity through land reform policies. In the case of the Adaptation In-Situ, the intervention was predominantly motivated by the State government's decision to develop a deep-sea port in Beguakhali for the transport of coal and iron ore. These governmental agendas can lead to the formation of pessimistic expectations of government intent, meaning that individuals believe that the government has no intent to provide climate change adaptation support (Chamlee-Wright and Storr, 2010).

Non-Adapted respondents also report pessimistic expectations of government capacity. They explain that there are many communities across Sagar Island and the region of West Bengal that are poor, socially marginalised, exposed to environmental risks, and in need of adaptation. In these circumstances, they explain, the government lacks the capacity and resources to help everyone. These findings are in line with Chamlee-Wright and Storr's (2010) argument on pessimistic capacity, namely that individuals believe that the government lack the necessary capacity to provide climate change adaptation support. Overall, these pessimistic expectations of government intent and capacity have been found to influence the formation of perceptions of fairness as far as outcomes are concerned. If people do not expect to be adapted, when they are, they perceive the outcomes as fair. These results are in line with the literature on how the perceived government intent and capacity can influence people's expectations (Chamlee-Wright and Storr, 2010). People's expectations of government are important in the formation of their perceptions of fairness as well as their wellbeing because they are a result of social and political context and complex dynamics of power (Mahali et al. 2018; McGregor et al., 2009).

These results offer a novel insight into fairness at local levels in climate change adaptation. Populations that have historically not experienced participatory approaches in decision-making do not anticipate them nor see them as their right. Populations that are living in areas no longer suitable for human habitation and with no means to adapt become effectively trapped. Expectations of distributive and procedural aspects do not appear to be the priority of populations in such



circumstances. Furthermore, pessimistic expectations of government intent and capacity influence the formation of perceptions of distributive fairness positively in the cases where the government chooses to intervene. When these social, economic, political, and environmental circumstances merge, populations appear to lack expectations of distributive and procedural fairness.

### **7.2.5 Planned relocation as an adaptation strategy**

Planned relocation is advocated in policy discourses and climate change adaptation literature as a potential adaptation intervention in response to climate change impacts (Baldwin, 2013; Hino et al., 2017). Nevertheless, most empirical work on planned relocation challenges its potential for successful adaptation, due primarily to its negative impacts on livelihoods (Arnall et al., 2013a; Barnett and Webber, 2009; de Haas, 2005). The results of this study, however, challenge these views. This study found that most relocated respondents viewed the Planned Relocation as a successful form of adaptation intervention to climate change. This section presents a discussion on whether planned relocation is, in fact, a climate change adaptation intervention. To do so the planned relocation is discussed here in light of the key principles for planned relocation as climate change adaptation put forward by Arnall (2019b).

The first key principle states that planned relocation as adaptation should only be undertaken as a measure of last resort. The Planned Relocation of communities from Lohachara Island and Ghoramara Island to Sagar Island was enforced in response to high rates of coastal erosion (Das and Hazra, 2020; Ghosh et al., 2014). The environmental change and degradation were so extreme that the government of West Bengal declared the islands 'no man's land' and withdrew funding for support and services (Mukhopadhyay, 2009). The loss of land degraded ecosystem services and affected the livelihoods of the many people depending on natural resources. Whilst many migrated in response to these circumstances, many more remained on the islands. They were exposed to

environmental risks and had limited capacity to adapt (Mortreux et al., 2018). These were the people that were then relocated to the nearby Sagar Island.

Here, this study argues, considering the environmental and socio-economic circumstances of the islanders, Planned Relocation was enforced as a measure of last resort. The islands of Lohachara and Ghoramara were eroding at a high rate and the government had already withdrawn funding for support and services. Since then, Lohachara Island submerged in 1991, and Ghoramara Island has lost 70% of its area since the 1950s (Ghosh et al., 2014; Hazra and Samanta, 2016). Relocated respondents speak of the Planned Relocation as a form of 'survival' as 'there was no other way'. Before the Planned Relocation, some respondents report living in precarious circumstances for up to a decade. They were homeless, landless, and lacked food security. The remaining coastal inhabitants of Ghoramara Island are highly exposed to environmental risks but have limited adaptive capacity, and consider themselves trapped (Stefancu, 2022). The argument put forward here is not that waiting until the last moment to adapt communities is the best option, but that adaptation interventions that involve the movement of people from their places of habitual residence should only be enforced when adaptation in-situ options have failed or are no longer available.

The second principle states that planned relocation as adaptation should be voluntary in nature. Relocated respondents report that the government has not imposed the Planned Relocation on them but also that they had no choice other than to move. They demonstrate voluntariness to move in a context where other adaptation options were not available. This finding supports Kalin's (2013) and Wilmsen and Wang's (2014) arguments that voluntary and involuntary choices are not a true dichotomy in the context of climate change. Results reveal that the Planned Relocation was enforced with the free and informed consent of those affected, despite the absence of participatory processes.

The third principle states that planned relocation as adaptation should be developmental in nature, in a way to reduce both exposure to environmental risks and vulnerabilities (de Sherbinin et al., 2011a; Hino et al., 2017). The results of this study indicate an improvement in both aspects. Relocated individuals

reported high exposure to environmental risks and low wellbeing in terms of availability of agricultural land, housing conditions, economic security, and food security before the Planned Relocation. After the Planned Relocation, the same set of respondents report an increased level of satisfaction with the natural environment, economic security, and food security, as well as improvements in housing conditions and availability of agricultural land. They express that the Planned Relocation improved their overall life circumstances. Whilst a distinction can be made between the Relocated households that were moved to Sagar Island in the initial stages of the Planned Relocation, and those that were moved at a later date, they both report improvements as far as the exposure to environmental risks and wellbeing are concerned.

These results highlight that this Planned Relocation can be considered a successful adaptation intervention because it was enforced as a measure of last resort that was voluntary and developmental in nature. Relocated respondents report increased levels of wellbeing and positive perceptions of fairness. As far as the principles for planned relocation as climate change adaptation are concerned, the first and second principles can be contradictory in some contexts. The first principle argues that planned relocation should only be undertaken when all other adaptation in-situ interventions have failed or are no longer possible, whilst the second principle states that the planned relocation should be voluntary in nature. However, in the case of socially marginalised communities that are exposed to environmental risks and lack adaptive capacity, the planned relocation is indeed an option of last resort. As shown by the results of this study, in these circumstances, trapped populations have no alternative other than to accept whatever government support is offered. In this context, the planned relocation cannot be voluntary in nature. Voluntariness exists only when people are willing to relocate when other adaptation options are still available. When no other adaptation options are available, regardless of whether people are willing to move, the planned relocation cannot be considered voluntary.

## 7.2.6 Planned relocation: adaptation to climate change and Loss and Damage

This section presents a reflection on how the findings of this study contribute to the bodies of work on planned relocation in the context of adaptation to climate change as well as in the context of so-called Loss and Damage under the UNFCCC. Researchers advocate that human mobility in response to the impacts of climate change should be considered as a form of adaptation (Bardsley and Hugo, 2010; Black et al., 2011; Castles, 2002; McLeman and Smit, 2006). In this context, planned relocation is described a form of adaptation intervention to adapt immobile populations (high exposure to environmental risks and limited adaptive capacity) that are living in environments no longer suitable for human habitation (Hino et al., 2017). The findings of this study support the claims that planned relocation is a suitable measure of last resort in adapting communities to the effects of climate change.

As discussed in section 7.2.5, the Planned Relocation in Lohachara Island and Ghoramara Island has been implemented when other forms of adaptation interventions were no longer possible. Since the Planned Relocation (1980s-1990s), Lohachara Island has entirely submerged (1991) and Ghoramara Island has lost 70% of its area since the 1950s. The current inhabitants of the coastal areas of Ghoramara Island are now trapped and await government intervention (Stefancu, 2022). These findings support the argument that planned relocation can in fact be an effective adaptation measure.

Others advocate that planned relocation should not be seen as an adaptation response but as a form of loss and damage. This led to interpretations of planned relocation in terms of a negative impact of climate change that ultimately causes loss and damage (Bettini, 2013; Felli, 2013; Gesing et al., 2014; Methmann and Oels, 2015). By applying Warner et al.'s (2012) definition of loss and damage – *“...negative effects of climate variability and climate change that people have not been able to cope with or adapt to”* – to the findings of this study, the following considerations can be made. The inhabitants of Lohachara Island and Ghoramara Island have experienced negative effects of climate change in terms

of loss of economic goods with instrumental value, such as dwellings, farmlands, and livelihoods. This shows that they had not been able to cope with or adapt to environmental risks. Considering these circumstances, it can be argued that the Planned Relocation did not lead to loss and damage, as most relocated individuals had already lost most of their assets at the time of the government intervention.

However, non-economic losses, defined by Barnett et al. (2016) as “*when people are dispossessed of things that they value, and for which there are no commensurable substitutes*” can be highlighted in the case of the Planned Relocation studied here. In this context, relocated individuals speak of personal and collective notions of identity. Relocated individuals often refer to themselves and their communities as the same entity as the islands. They speak of the degradation of the islands and their lives synonymously. The climate change impacts on their habitats are found to lead to a perceived loss of identity (Preston, 2017). Relocated respondents also make sense of their lives as relational selves, and often assess their life circumstances at community level. Those relocated to Sagar Island express a deep concern for the remaining inhabitants of Ghoramara Island, and they continue to consider them as part of their community. The relocation of only a portion of the inhabitants of Ghoramara Island led to a perceived community disarticulation. These losses obfuscate non-quantifiable aspects of harm that are important to people within their own contexts, ultimately constituting an injustice (McShane, 2017). Here, loss and damage can, therefore, be considered as a direct result of both climate change impacts as well as planned relocation.

Some argue that planned relocation burdens people with the need to move, instead of adapting them in-situ, and can thus be seen as an adaptation failure (Heine and Petersen, 2008; Raleigh and Jordan, 2010). However, the case of Lohachara Island specifically shows that adaptation in-situ was not a feasible solution due to a combination of mangrove loss, coastal erosion, and exposure to rapid-onset disasters. The findings of this study exemplify McNamara et al.’s (2018) proposition, which puts forward the idea that planned relocation in the

context of climate change can be adaptation and loss and damage at the same time. Furthermore, government inaction is also perceived as leading to both economic and non-economic losses, constituting loss and damage.

## **7.3 Robustness and generalizability of findings**

### **7.3.1 The issue of data collection methods**

The robustness of these findings is supported by the chosen research approach. As discussed in Chapter 3, this study employs a mixed methods approach for both the purpose of development and expansion. In terms of the development of the empirical aspect of the study, narrative interviews are employed to identify aspects of wellbeing and perceptions of fairness that are valued by the local sub-populations. These criteria – alongside criteria identified in the literature on wellbeing and fairness – informed the development of the survey and the semi-structured interviews. The choice to identify the criteria for the investigation of this study by combining inductive and deductive approaches is supported by other empirical studies. For example, studies on wellbeing advocate for the inclusion of wellbeing aspects that describe what people consider to be living a good life (Camfield et al., 2009; Gasper, 2010; McGregor et al., 2015a; Robeyns, 2005) and for fairness aspects that are relevant to the local community (Adger et al., 2016; Lecuyer et al., 2018; Smith and McDonough, 2001).

In terms of expansion, the mixed methods allow data to be collected quantitatively and qualitatively against both wellbeing and fairness criteria. This triangulation leads to a reduction of bias that comes with using a single method and an enhanced validity of results as confirmed by multiple methods. The qualitative data also sheds light on the quantitative findings and ensures that the interpretation of results is in line with the social, economic, cultural, and political considerations of the participants in the study. The choice to use a mixed methods approach is supported by existing empirical studies on wellbeing (Camfield et al., 2009; Gasper, 2010; McGregor, 2004) and perceptions of

fairness (Adger et al., 2016; Bennett and Dearden, 2014; Silva and Mosimane, 2012).

Another aspect that has the ability to influence the robustness of results is the use of long recall in investigating people's circumstances before government action and inaction. Studies that aim to track changes in wellbeing can use longitudinal designs where the same set of criteria is collected in real-time at different points in time. A longitudinal design was not suitable for the chosen case studies as the government interventions that are the focus of this study occurred at different times in the past. However, in this case, the long recall approach worked well as participants were asked to reflect on significant and meaningful events that they have likely reflected on and have good memories of. Overall, it can be argued that the findings produced by this study are robust. The choice of the research design and approach is suitable for answering the research questions and is supported by the use of other empirical studies.

### **7.3.2 The issue of novel results**

The results of this study on the impact of planned relocation on wellbeing and perceptions of fairness extend and dispute aspects of previous research. Piggot-McKellar et al. (2019) argue that planned relocation interventions should specifically focus on support for the reconstruction of livelihoods. This is because empirical evidence suggests that planned relocation negatively impacts livelihoods (Arnall, 2013a; Badri et al., 2006; Oliver-Smith, 2009; Piggott-McKellar et al., 2019; Mathur, 2008). This study's results support Piggot-McKellar et al. (2019) claim on the importance of livelihoods in planned relocations, as livelihoods have been the key wellbeing aspect that Relocated respondents highlighted. However, the Planned Relocation from the sinking islands of Lohachara and Ghoramara to Sagar Island shows an improvement in livelihoods. This difference in findings, however, does not challenge the robustness of the results presented in this thesis, as this contradiction can be explained.

The Relocated households at the centre of this study were landless before the Planned Relocation, whilst at the time of the study, they report owning small plots of farmland. The agricultural land was given to them by the government as part of the Planned Relocation. This change in agricultural land tenure status allowed them to return to traditional subsistence agriculture practices. Due to these circumstances, they report an increase in material wellbeing, and specifically, in livelihoods, as a consequence of the Planned Relocation. The specific circumstances of the Planned Relocation on Sagar Island, therefore, offer a novel set of empirical results that extend the understanding of planned relocation.

The results on perceptions of fairness also run counter to the vast literature that suggests that participatory processes are a prerequisite for perceived legitimacy, acceptance of outcomes, and just adaptation. In a 2019 study in Fiji, Piggot-McKellar et al. (2019) show that participatory decision-making is of utmost importance to the relocated community. The importance of such a participatory process is outlined by other researchers (Correa et al., 2011; de Sherbinin et al., 2011a; Ferris, 2015; Kingston and Marino, 2010; McAdam and Ferris, 2015; McNamara and des Combes; 2015) as well as established international guidelines (UNHCR, 2015). The results presented in this study challenge this vast literature by arguing that the Relocated individuals on Sagar Island did not have expectations as far as procedural justice was concerned.

This is due to the local and regional governmental system in West Bengal, which has traditionally not involved citizens in decision-making processes. Local communities are represented by the village-level leader (the Pradhan) in such matters. Respondents report that, as 'commoners', it is not their place to have a say. Furthermore, they also report that prior to the Planned Relocation, they were landless, homeless, and severely exposed to environmental hazards, so any form of adaptation intervention would have been accepted. However, those who had a say in choosing the location for their new settlement reported having perceived the Planned Relocation as fairer than those who have not had this opportunity. Perceptions of fairness, here, are nonetheless formed in distributive terms: those that had a say were able to choose a better location, which led to better outcomes;



those that had not had a say were relocated to locations on the coastal areas of Sagar Island exposed to coastal erosion, which led to worse outcomes.

## **7.4 Policy recommendations**

### **7.4.1 Policy recommendations at the regional and national level**

The findings of this study show that planned relocation can be considered fair and developmental by relocated individuals. The lessons learnt from the Planned Relocation processes and outcomes on Sagar Island could, therefore, be considered a case study by the government of West Bengal to inform future adaptation intervention choices. This is of particular importance as other islands in the Ganges-Brahmaputra Delta are exposed to coastal erosion and storm surges, yet planned relocation remains an institutional blind spot in the climate change adaptation approach in West Bengal. The disaster legislation and district policies overlook planned relocation, whilst government guidance on planned relocation overlooks natural disasters.

Planned relocation is not considered in legislation and policies on environmental disaster management. The National Disaster Management Act of 2005 highlights the establishment of the National Disaster Management Authority to implement the aims of the Act, and specifically to develop policies and guidelines on disaster management. The guidelines for minimum standards of relief focus on (i) the minimum requirements to be provided in disaster relief camps, (ii) special provisions for widows, orphans, and loss of life, (iii) assistance on account of damage to dwellings and restoration of means of livelihood, and (iv) other relief as may be necessary (Ministry of Law and Justice, 2005). The Act, however, does not make any provisions for situations where dwellings and livelihoods cannot be restored in-situ, such as the case of sinking islands. It also defers the responsibility for drafting specific Disaster Management Plans to the District Authority.

In the 24 South Parganas District, where Sagar Island is situated, there is a Disaster Management Plan that was updated in 2020. The strategy of this plan primarily focuses on relief in the immediate aftermath of natural disasters, overlooking considerations on adaptation options for those permanently displaced. Planned relocation is mentioned as a temporary option during the repair or construction of houses damaged by disasters. Planned relocation is mentioned as a permanent option in the case where human habitation is no longer viable at the site of interest. However, the only guidance on permanent planned relocation is that *“the relocation site should be in close proximity to the existing sources of livelihood (places of work, agricultural farms, livestock facilities, markets, etc). This ensures favourable conditions for livelihood generation and other economic activities.”* (West Bengal Disaster Management and Civil Defence Department, 2020).

The Disaster Management Plan could include additional guidance on how fair planned relocation that aims to improve outcomes for vulnerable and socially marginalised groups should be implemented. The issue of livelihoods is highlighted by the district-level Disaster Management Plan. The results of this study show that the issue of livelihoods is central to the wellbeing of relocated individuals and the success of the planned relocation as an adaptation strategy. The results also show that the success of the Planned Relocation investigated here was dependent on the provision of new agricultural lands for relocated households. The Disaster Management Plan specifies that the relocation site should be in close proximity to existing sources of livelihood but lacks information on what should be done in the case where these livelihoods are no longer available as a consequence of the natural disaster.

The National Policy on Resettlement and Rehabilitation as well as the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation, and Resettlement Act focus on planned relocation in the context of development projects, without any provisions offered for planned relocation in the context of environmental disasters (Ministry of Rural Development, 2007; Ministry of Law and Justice, 2013). The latter Act outlines provisions for property compensation

and entitlements for livelihood losses following public acquisitions of private land, which guarantees compensation to populations relocated due to large-scale development projects, such as embankments. This protects the interests of those populations that can be adapted in-situ. No provisions are available for populations that are predicted to lose their homes and lands due to environmental risks and degradation. At a district level, the Rehabilitation Office, which sits under the State of West Bengal's Department of Refugees and Resettlement, is responsible for relocating refugees but not people displaced by environmental risks and degradation (South 24 Parganas District, 2015).

The review of existing provisions for disaster management strategies and planned relocation strategies in India, and specifically in the district of West Bengal, highlights the lack of policy on planned relocation as adaptation to climate change. The case studies presented throughout this thesis, such as the Planned Relocation of people from the now sunken island of Lohachara and the lack of adaptation in Dhablat (Sagar Island), highlight the need for planned relocation. Studies on the remaining population of Ghoramara Island also describe it as trapped and in need of relocation (Stefancu, 2022). Therefore, this study highlights the need for policy development on planned relocation at the district and national levels in India. While international actors can play an important supportive role, planned relocation in the context of climate change is, first and foremost, a responsibility of the State (Ferris and Weerasinghe, 2020).

Drawing on the findings of this study a number of considerations for planned relocation policy can be put forward.

- Planned relocation policies with the stated aim to adapt people and groups of people to the effects of climate change should be fair and aim to improve the wellbeing of vulnerable and marginalised groups.
- Fairness in planned relocation should not be considered in terms of external measures of adherence or breaches of rights but defined in context. Definitions of fairness should be developed in participatory contexts where people's values, needs, and preferences are recognised.

- The measurement of results of planned relocation policies with the stated aim to adapt people to the effects of climate change should go beyond external measures of reduced exposure to environmental risks and economic circumstances. For planned relocation to be developmental in nature, the aim of the policy should account for material as well as non-material aspects of lives that are valued by the local populations. Particular attention should be paid to the issue of agricultural lands, as the deltaic population of West Bengal relies on subsistence agricultural practices. The results of this study show that the Planned Relocation is perceived as most fair and developmental when relocated households are appointed new plots of land.

#### **7.4.2 Policy recommendations at the international level**

The 2010 Conference of the Parties (COP) to the UN Framework Convention on Climate Change (UNFCCC) placed the issue of planned relocation on the international agenda by inviting parties to promote “*understanding, coordination, and cooperation with regard to climate changed induced displacement, migration, and planned relocation*” (UNFCCC 2011, para. 14(f)). Since then, international guidance on what constitutes effective planned relocation and practical tools to assist local and national authorities in the design and implementation of planned relocation has emerged. This section puts forward considerations on how the findings of this study could inform such guidance documents and practical tools in ensuring a fair and developmental planned relocation.

In 2015, the Guidance on Protecting People from Disasters and Environmental Change through Planned Relocation was developed by Georgetown University, Brookings Institution, and the UNHCR. Three aspects of this Guidance are relevant to the findings of this study. First, the Guidance highlights the need for information, consultation, and participation in decision-making processes, specifying that “*Relocated Persons [should] be involved in, contribute to, have ownership of, and make informed choices about, each stage of the Planned Relocation*” (2015, pp. 22). The findings of this study show that some poor and

socially marginalised populations have low expectations of participatory processes. However, when having the opportunity to make informed choices that directly affect the outcomes of the Planned Relocation in a way that is perceived as satisfactory, Relocated individuals are more satisfied and accepting of outcomes. This study recommends that policymakers should not automatically adopt top-down approaches to justice when designing and implementing planned relocations. Understanding the expectations of the local populations as far as their role in the decision-making processes is concerned allows for a more nuanced promotion of justice.

Second, the Guidance highlights the need for providing conditions for rebuilding lives through livelihood restoration. The findings of this study demonstrate the centrality of agricultural land for relocated individuals that rely on traditional subsistence agriculture practices. The Guidance highlights the need to *“mitigate the risks of impoverishment, including those stemming from [...] landlessness”* and to *“maintain their traditional or previous livelihoods”* (2015, pp. 24). Specific provisions for relocated persons that rely on agricultural lands for their livelihoods could be put in place, both in terms of livelihood regeneration and compensation. The Guidance specifies that *“If States acquire title to land vacated by Relocated Persons, such persons or groups of persons should have the right to equitable compensation for their land and any other relinquished assets related to that land”* (2015, pp. 24). The Guidance, however, fails to address compensation in instances where land and assets related to land are disappearing due to coastal erosion or sea level rise, for example. The Guidance, similarly to India’s Rehabilitation and Resettlement Act, only covers provisions for when the State acquires the land from where populations are relocated. The findings of this study suggest that policies should also address instances where planned relocation is enforced as a measure of last resort in environments that are disappearing.

The 2010 Conference of the Parties (COP) to the UN Framework Convention on Climate Change (UNFCCC) also established a work programme on loss and damage. As a result, the Warsaw International Mechanism for Loss and Damage is the main instrument in the UNFCCC process to address loss and damage

related to climate change impacts in developing countries that are particularly vulnerable to the adverse effects of climate change. The findings of this study highlight the importance of both economic and non-economic loss and damage. The case of Lohachara Island is an example of an environmental event that led to irreversible and permanent loss and damage of territory, agricultural production, property, and social and cultural identity.

It is important to highlight that often loss and damage in the context of planned relocation are discussed as a repercussion of the government intervention. This study is an example where it was not the planned relocation that led to loss and damage, but the environmental conditions experienced prior to the planned relocation that led to the economic and non-economic loss and damage. This study recommends that planned relocation policies in the context of climate change should include considerations on both adaptation and loss and damage.

## **7.5 Conclusion**

This study sheds light on the consequences of planned relocation, alongside other forms of government action and inaction, in the context of climate change. It expands the scope of analysis to incorporate multiple dimensions of wellbeing and fairness. The study applies what is becoming a well-established way to incorporate multiple dimensions of wellbeing, by accounting for material, subjective, and relational aspects. Nevertheless, this is probably the first time that the multidimensional wellbeing framework has been applied to assess what happens to people when they are relocated. This is a development from studies that simply address the risk and benefits of planned relocation in terms of material conditions. Whilst evaluations of planned relocation commonly focus on assessing the government intervention, they often overlook the impacts of uneven government action and inaction. This study, therefore, compares the impacts of planned relocation, as well as interventions for adaptation in-situ and circumstances without intervention, on multidimensional wellbeing.

This study contributes to a rethinking of the concept of justice at local levels in planned relocation, as well as interventions for adaptation in-situ and circumstances without intervention, by exploring perceptions of fairness. Fairness, though necessarily defined in context, relates to fairness in decision-making (procedural justice) and outcomes (distributive justice). Most studies on justice position rights as external to the process and in some cases use 'objective' or external measures of adherence or breaches of rights. So, applying the social science of whether people perceive and feel they are visible and taken into account (procedural justice) and their opinions on outcomes (distributive justice) together reveals rather nuanced findings on how people make sense of government action and inaction in the context of climate change.

Finally, considerations on how the structure of the Indian legislative system, environmental and socio-economic circumstances, and expectations of government based on historical approaches and perceived government intent and capacity influence perceptions of fairness, which in turn influence assessments of wellbeing, are discussed.

# Appendices

## Appendix 1. The survey

<b>Part 1. Introduction</b>	
Please record the GPS locations	.....
The date	dd/mm/yyyy
The location	<input type="checkbox"/> Bankimnagar (Relocated) <input type="checkbox"/> Jibontala (Relocated) <input type="checkbox"/> Beguakhali (Adapted In-Situ) <input type="checkbox"/> Dhablat (Non-Adapted)
The aim of the study has been explained to the respondent as per the information sheet:	<input type="checkbox"/> Yes <input type="checkbox"/> No
The respondent gives informed consent to participate to the study:	<input type="checkbox"/> Yes <input type="checkbox"/> No
What is the gender of the non-respondent?	<input type="checkbox"/> Male <input type="checkbox"/> Female
<b>Part 2. Socio-demographic characteristics</b>	
What is your name?	.....
Are you the household head?	<input type="checkbox"/> Yes <input type="checkbox"/> No
What is your relationship with the household head?	<input type="checkbox"/> Parent of the household head <input type="checkbox"/> Partner/ spouse of the household head <input type="checkbox"/> Child of household head (over 18) <input type="checkbox"/> Grandchild of household head (over 18) <input type="checkbox"/> Relative other <input type="checkbox"/> Non-relative <input type="checkbox"/> Don't know / Prefer not to answer
What is your gender?	<input type="checkbox"/> Male <input type="checkbox"/> Female
What is your age? <i>If unsure enter an estimate. If unable to estimate, enter 99.</i>	.....
What is your caste?	<input type="checkbox"/> General <input type="checkbox"/> Scheduled Castes <input type="checkbox"/> Scheduled Tribes Castes <input type="checkbox"/> Other Backward Class <input type="checkbox"/> Don't know / Prefer not to answer
What is your religion?	<input type="checkbox"/> Hindu <input type="checkbox"/> Muslim <input type="checkbox"/> Other <input type="checkbox"/> Don't know / Prefer not to answer
What is your education level?	<input type="checkbox"/> No schooling <input type="checkbox"/> Class 1-3 <input type="checkbox"/> Class 4-5 <input type="checkbox"/> Class 6-8 <input type="checkbox"/> Class 9-10 <input type="checkbox"/> Class 11-12 <input type="checkbox"/> Higher education <input type="checkbox"/> Don't know / Prefer not to answer
What is your livelihood today? <i>If the respondent has multiple livelihoods, please tick all the necessary boxes in order of importance.</i>	<input type="checkbox"/> Crop farmer <input type="checkbox"/> Livestock farmer <input type="checkbox"/> Fish / shrimp farmer <input type="checkbox"/> Fishing



	<input type="checkbox"/> Regular salaried employee <input type="checkbox"/> Small business owner <input type="checkbox"/> Construction worker <input type="checkbox"/> Factory worker <input type="checkbox"/> Domestic employee <input type="checkbox"/> Trader, dressmaker / tailor <input type="checkbox"/> Transporter worker (i.e. rickshaw puller, taxi driver) <input type="checkbox"/> Hawker <input type="checkbox"/> Guard / gardener <input type="checkbox"/> Daily labourer <input type="checkbox"/> Money lender <input type="checkbox"/> Unpaid home carer <input type="checkbox"/> Unemployed <input type="checkbox"/> Other <input type="checkbox"/> Don't know / Prefer not to answer
You have selected 'other' in the previous question. Please specify.	.....
What is your employment status today?	<input type="checkbox"/> Working permanent job <input type="checkbox"/> Working seasonal job <input type="checkbox"/> Working short term job (i.e. day labourer) <input type="checkbox"/> Don't know / Prefer not to answer
On average, at the present time, how much do you ear per month from this livelihood activity?	.....
Has any member of your household migrated in the last five years?	<input type="checkbox"/> Yes <input type="checkbox"/> No
How would you describe the migration?	<input type="checkbox"/> Permanent <input type="checkbox"/> Once or twice a year depending on the season <input type="checkbox"/> Often for short periods <input type="checkbox"/> Don't know / Prefer not to answer
Where did they migrate to?	.....
For which reason they migrated? <i>If there are multiple reasons, please tick all the necessary boxes in order of importance.</i>	<input type="checkbox"/> Seeking employment <input type="checkbox"/> Seeking education <input type="checkbox"/> To join spouse / marriage <input type="checkbox"/> Family obligations / problems <input type="checkbox"/> Health care <input type="checkbox"/> Housing problems <input type="checkbox"/> Debt <input type="checkbox"/> Loss of income one season <input type="checkbox"/> Loss of income multiple seasons <input type="checkbox"/> Environmental degradation (i.e. drought, erosion) <input type="checkbox"/> Extreme event (i.e. flooding, cyclone) <input type="checkbox"/> Social / political problems (i.e. discrimination, bad law and order) <input type="checkbox"/> Other <input type="checkbox"/> Don't know / Prefer not to answer
You have selected 'other' in the previous question. Please specify.	.....
<b>Part 3. Wellbeing</b>	
<b>Material Wellbeing: present (all populations)</b>	
Do you or your family own the dwelling you live in today?	<input type="checkbox"/> Yes, I/we own the dwelling <input type="checkbox"/> No, the dwelling is mortgaged <input type="checkbox"/> No, I/we rent the dwelling <input type="checkbox"/> No, I/we are squatting

	<input type="checkbox"/> I don't know / Prefer not to answer
How big is the dwelling you and your family live in today? (in Katthas)	.....
What is the main material of your roof at your dwelling today? <i>If materials are evenly mixed, then choose the most wealthy material: i.e. tiles instead of hay</i>	<input type="checkbox"/> Wood <input type="checkbox"/> Stone / brick / slate <input type="checkbox"/> Cement / tiles / asbestos <input type="checkbox"/> Plastic / polythene <input type="checkbox"/> Tin / corrugate <input type="checkbox"/> Hay / leaves / branches / jute bags <input type="checkbox"/> Other <input type="checkbox"/> I don't know / Prefer not to answer
You have selected 'other' in the previous question. Please specify.	.....
What is your main source of drinking water today?	<input type="checkbox"/> Piped water <input type="checkbox"/> Standpipe <input type="checkbox"/> Tubewell / borehole <input type="checkbox"/> Dug well <input type="checkbox"/> Spring <input type="checkbox"/> Rainwater <input type="checkbox"/> Surface water (i.e. river / pond / canal) <input type="checkbox"/> Other <input type="checkbox"/> I don't know / Prefer not to answer
You have selected 'other' in the previous question. Please specify.	.....
What kind of latrine do you use today?	<input type="checkbox"/> Flushing toilet <input type="checkbox"/> Pit latrine <input type="checkbox"/> No facility / bush / field <input type="checkbox"/> Other <input type="checkbox"/> I don't know / Prefer not to answer
You have selected 'other' in the previous question. Please specify.	.....
How big is the area you farm today? (i.e. crops, livestock, aquaculture) (in Bigha)	.....
To what extent do you agree with the following statements?	
At present, I have a stable income.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
At present, I rely on financial support from family and friends.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
At present, I rely on remittances being sent from family members.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
<b>Material Wellbeing: past (Relocated population)</b>	
Did you or your family owned the dwelling you lived in a year before being relocated?	<input type="checkbox"/> Yes, I/we owned the dwelling <input type="checkbox"/> No, the dwelling was mortgaged <input type="checkbox"/> No, I/we rented the dwelling <input type="checkbox"/> No, I/we were squatting <input type="checkbox"/> I don't know / Prefer not to answer

How big was the dwelling you and your family lived in a year before being relocated? (in Katthas)	.....
What was the main material of the roof of the dwelling you lived in a year before being relocated? <i>If materials are evenly mixed, then use the most wealthy material (i.e. tiles instead of hay)</i>	<input type="checkbox"/> Wood <input type="checkbox"/> Stone / brick / slate <input type="checkbox"/> Cement / tiles / asbestos <input type="checkbox"/> Plastic / polythene <input type="checkbox"/> Tin / corrugate <input type="checkbox"/> Hay / leaves / branches / jute bags <input type="checkbox"/> Other <input type="checkbox"/> I don't know / Prefer not to answer
You have selected 'other' in the previous question. Please specify.	.....
What was your main source of drinking water a year before being relocated?	<input type="checkbox"/> Piped water <input type="checkbox"/> Standpipe <input type="checkbox"/> Tubewell / borehole <input type="checkbox"/> Dug well <input type="checkbox"/> Spring <input type="checkbox"/> Rainwater <input type="checkbox"/> Surface water (i.e. river / pond / canal) <input type="checkbox"/> Other <input type="checkbox"/> I don't know / Prefer not to answer
You have selected 'other' in the previous question. Please specify.	.....
What kind of latrine did you use a year before being relocated?	<input type="checkbox"/> Flushing toilet <input type="checkbox"/> Pit latrine <input type="checkbox"/> No facility / bush / field <input type="checkbox"/> Other <input type="checkbox"/> I don't know / Prefer not to answer
You have selected 'other' in the previous question. Please specify.	.....
Did you use to farm a year before being relocated?	<input type="checkbox"/> Yes <input type="checkbox"/> No
How big was the area you used to farm a year before being relocated? (i.e. crops, livestock, aquaculture) (in Bigha)	.....
What was your livelihood a year before being relocated? <i>If the respondent has multiple livelihoods, please tick all the necessary boxes in order of importance.</i>	<input type="checkbox"/> Crop farmer <input type="checkbox"/> Livestock farmer <input type="checkbox"/> Fish / shrimp farmer <input type="checkbox"/> Fishing <input type="checkbox"/> Regular salaried employee <input type="checkbox"/> Small business owner <input type="checkbox"/> Construction worker <input type="checkbox"/> Factory worker <input type="checkbox"/> Domestic employee <input type="checkbox"/> Trader, dressmaker / tailor <input type="checkbox"/> Transporter worker (i.e. rickshaw puller, taxi driver) <input type="checkbox"/> Hawker <input type="checkbox"/> Guard / gardener <input type="checkbox"/> Daily labourer <input type="checkbox"/> Money lender <input type="checkbox"/> Unpaid home carer <input type="checkbox"/> Unemployed <input type="checkbox"/> Other <input type="checkbox"/> Don't know / Prefer not to answer

You have selected 'other' in the previous question. Please specify.	.....
<b>Material Wellbeing: past (Adapted In-Situ population)</b>	
Do you live in the same dwelling you lived in a year before the embankment being build?	<input type="checkbox"/> Working permanent job <input type="checkbox"/> Working seasonal job <input type="checkbox"/> Working short term job (i.e. day labourer) <input type="checkbox"/> Don't know / Prefer not to answer
Did you or your family owned the dwelling you lived in a year before the embankment being build?	.....
How big was the dwelling you and your family lived in a year before the embankment being build? (in Katthas)	<input type="checkbox"/> Yes <input type="checkbox"/> No
What was the main material of the roof of the dwelling you lived in a year before the embankment being build? <i>If materials are evenly mixed, then use the most wealthy material (i.e. tiles instead of hay)</i>	<input type="checkbox"/> Permanent <input type="checkbox"/> Once or twice a year depending on the season <input type="checkbox"/> Often for short periods <input type="checkbox"/> Don't know / Prefer not to answer
You have selected 'other' in the previous question. Please specify.	.....
What was your main source of drinking water a year before the embankment being build?	<input type="checkbox"/> Seeking employment <input type="checkbox"/> Seeking education <input type="checkbox"/> To join spouse / marriage <input type="checkbox"/> Family obligations / problems <input type="checkbox"/> Health care <input type="checkbox"/> Housing problems <input type="checkbox"/> Debt <input type="checkbox"/> Loss of income one season <input type="checkbox"/> Loss of income multiple seasons <input type="checkbox"/> Environmental degradation (i.e. drought, erosion) <input type="checkbox"/> Extreme event (i.e. flooding, cyclone) <input type="checkbox"/> Social / political problems (i.e. discrimination, bad law and order) <input type="checkbox"/> Other <input type="checkbox"/> Don't know / Prefer not to answer
You have selected 'other' in the previous question. Please specify.	.....
What kind of latrine did you use a year before the embankment being build?	<input type="checkbox"/> Flushing toilet <input type="checkbox"/> Pit latrine <input type="checkbox"/> No facility / bush / field <input type="checkbox"/> Other <input type="checkbox"/> I don't know / Prefer not to answer
You have selected 'other' in the previous question. Please specify.	.....
Did you use to farm a year before the embankment being built?	<input type="checkbox"/> Yes <input type="checkbox"/> No
How big was the area you used to farm a year before the embankment being build? (i.e. crops, livestock, aquaculture) (in Bigha)	.....
What was your livelihood a year before the embankment being build? <i>If the respondent has multiple livelihoods, please tick all the necessary boxes in order of importance.</i>	<input type="checkbox"/> Crop farmer <input type="checkbox"/> Livestock farmer <input type="checkbox"/> Fish / shrimp farmer <input type="checkbox"/> Fishing <input type="checkbox"/> Regular salaried employee

	<input type="checkbox"/> Small business owner <input type="checkbox"/> Construction worker <input type="checkbox"/> Factory worker <input type="checkbox"/> Domestic employee <input type="checkbox"/> Trader, dressmaker / tailor <input type="checkbox"/> Transporter worker (i.e. rickshaw puller, taxi driver) <input type="checkbox"/> Hawker <input type="checkbox"/> Guard / gardener <input type="checkbox"/> Daily labourer <input type="checkbox"/> Money lender <input type="checkbox"/> Unpaid home carer <input type="checkbox"/> Unemployed <input type="checkbox"/> Other <input type="checkbox"/> Don't know / Prefer not to answer
You have selected 'other' in the previous question. Please specify.	.....
<b>Material Wellbeing: past (Non-Adapted population)</b>	
Do you live in the same dwelling you lived in ten years ago?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Did you or your family owned the dwelling you lived in ten years ago?	<input type="checkbox"/> Yes, I/we owned the dwelling <input type="checkbox"/> No, the dwelling was mortgaged <input type="checkbox"/> No, I/we rented the dwelling <input type="checkbox"/> No, I/we were squatting <input type="checkbox"/> I don't know / Prefer not to answer
How big was the dwelling you and your family lived in ten years ago? (in Katthas)	.....
What was the main material of the roof of the dwelling you lived in ten years ago? <i>If materials are evenly mixed, then use the most wealthy material (i.e. tiles instead of hay)</i>	<input type="checkbox"/> Wood <input type="checkbox"/> Stone / brick / slate <input type="checkbox"/> Cement / tiles / asbestos <input type="checkbox"/> Plastic / polythene <input type="checkbox"/> Tin / corrugate <input type="checkbox"/> Hay / leaves / branches / jute bags <input type="checkbox"/> Other <input type="checkbox"/> I don't know / Prefer not to answer
You have selected 'other' in the previous question. Please specify.	.....
What was your main source of drinking water ten years ago?	<input type="checkbox"/> Piped water <input type="checkbox"/> Standpipe <input type="checkbox"/> Tubewell / borehole <input type="checkbox"/> Dug well <input type="checkbox"/> Spring <input type="checkbox"/> Rainwater <input type="checkbox"/> Surface water (i.e. river / pond / canal) <input type="checkbox"/> Other <input type="checkbox"/> I don't know / Prefer not to answer
You have selected 'other' in the previous question. Please specify.	.....
What kind of latrine did you use ten years ago?	<input type="checkbox"/> Flushing toilet <input type="checkbox"/> Pit latrine <input type="checkbox"/> No facility / bush / field <input type="checkbox"/> Other <input type="checkbox"/> I don't know / Prefer not to answer
You have selected 'other' in the previous question. Please specify.	.....
Did you use to farm ten years ago?	<input type="checkbox"/> Yes <input type="checkbox"/> No

How big was the area you used to farm ten years ago? (i.e. crops, livestock, aquaculture) (in Bigha)	.....
What was your livelihood ten years ago? <i>If the respondent has multiple livelihoods, please tick all the necessary boxes in order of importance.</i>	<input type="checkbox"/> Crop farmer <input type="checkbox"/> Livestock farmer <input type="checkbox"/> Fish / shrimp farmer <input type="checkbox"/> Fishing <input type="checkbox"/> Regular salaried employee <input type="checkbox"/> Small business owner <input type="checkbox"/> Construction worker <input type="checkbox"/> Factory worker <input type="checkbox"/> Domestic employee <input type="checkbox"/> Trader, dressmaker / tailor <input type="checkbox"/> Transporter worker (i.e. rickshaw puller, taxi driver) <input type="checkbox"/> Hawker <input type="checkbox"/> Guard / gardener <input type="checkbox"/> Daily labourer <input type="checkbox"/> Money lender <input type="checkbox"/> Unpaid home carer <input type="checkbox"/> Unemployed <input type="checkbox"/> Other <input type="checkbox"/> Don't know / Prefer not to answer
You have selected 'other' in the previous question. Please specify.	.....
<b>Subjective Wellbeing: present (all populations)</b>	
At present, how satisfied are you with your life in general?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
At present, how satisfied are you with the quality of the natural environment?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
At present, how satisfied are you with work opportunities?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
At present, how satisfied are you with the economic security?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
At present, how satisfied are you with the food security?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
At present, how satisfied are you with the drinking water?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
At present, how satisfied are you with health?	<input type="checkbox"/> Very unsatisfied

	<input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
At present, how satisfied are you with housing?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
At present, how satisfied are you with children's residence?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
At present, how satisfied are you with the relations with your family?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
At present, how satisfied are you with the relations with your community?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
<b>Subjective Wellbeing: past (Relocated population)</b>	
A year before the relocation, how satisfied were you with your life in general?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the relocation, how satisfied were you with the quality of the natural environment?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the relocation, how satisfied were you with work opportunities?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the relocation, how satisfied were you with the economic security?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the relocation, how satisfied were you with the food security?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the relocation, how satisfied were you with the drinking water?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the relocation, how satisfied were you with health?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied

	<input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the relocation, how satisfied were you with housing?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the relocation, how satisfied were you with children's residence?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the relocation, how satisfied were you with the relations with your family?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the relocation, how satisfied were you with the relations with your community?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
<b>Subjective Wellbeing: past (Adapted In-Situ population)</b>	
A year before the embankment being built, how satisfied were you with your life in general?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the embankment being built, how satisfied were you with the quality of the natural environment?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the embankment being built, how satisfied were you with work opportunities?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the embankment being built, how satisfied were you with the economic security?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the embankment being built, how satisfied were you with the food security?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the embankment being built, how satisfied were you with the drinking water?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the embankment being built, how satisfied were you with health?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied



	<input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the embankment being built, how satisfied were you with housing?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the embankment being built, how satisfied were you with children's residence?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the embankment being built, how satisfied were you with the relations with your family?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
A year before the embankment being built, how satisfied were you with the relations with your community?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
<b>Subjective Wellbeing: past (Non-Adapted population)</b>	
Ten years ago, how satisfied were you with your life in general?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
Ten years ago, how satisfied were you with the quality of the natural environment?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
Ten years ago, how satisfied were you with work opportunities?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
Ten years ago, how satisfied were you with the economic security?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
Ten years ago, how satisfied were you with the food security?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
Ten years ago, how satisfied were you with the drinking water?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
Ten years ago, how satisfied were you with health?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied

	<input type="checkbox"/> Very satisfied
Ten years ago, how satisfied were you with housing?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
Ten years ago, how satisfied were you with children's residence?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
Ten years ago, how satisfied were you with the relations with your family?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
Ten years ago, how satisfied were you with the relations with your community?	<input type="checkbox"/> Very unsatisfied <input type="checkbox"/> Moderately unsatisfied <input type="checkbox"/> Neither satisfied nor unsatisfied <input type="checkbox"/> Moderately satisfied <input type="checkbox"/> Very satisfied
To what extent do you agree with the following statements:	
<b>Part 4. Perceptions of fairness</b>	
<b>Perceptions of fairness (Relocated population)</b>	
I was able to participate in decision-making processes.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
I was able to express my views, concerns and preferences.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
I believe my views, concerns and preferences were taken into account.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
I was able to influence the decisions made by the government.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
Relocation packages were given in proportion to what was owned on Ghoramara / Lohachara Islands.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
Relocation packages have been equal (i.e. dwelling, amount of land, pond).	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
Those who needed it most have been relocated first.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree

	<input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
Overall, I think the outcome was fair.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
<b>Perceptions of fairness (Adapted In-Situ population)</b>	
I was able to participate in decision-making processes.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
I was able to express my views, concerns and preferences.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
I believe my views, concerns and preferences were taken into account.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
I was able to influence the decisions made by the government.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
Support was given in proportion of what was lost (i.e. dwelling, amount of land, pond)	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
Support was given equally.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
Support was given to those who needed it most.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
Overall, I think the outcome was fair.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
<b>Perceptions of fairness (Non-Adapted population)</b>	
I was able to participate in decision-making processes.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
I was able to express my views, concerns and preferences.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree

	<input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
I believe my views, concerns and preferences were taken into account.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
I was able to influence the decisions made by the government.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
Support was given in proportion of what was lost (i.e. dwelling, amount of land, pond)	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
Support was given equally.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
Support was given to those who needed it most.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly
Overall, I think the outcome was fair.	<input type="checkbox"/> Disagree strongly <input type="checkbox"/> Disagree a little <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree a little <input type="checkbox"/> Agree strongly

## Bibliography

Aarhus Convention (1998) *Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters*, United Nations Economic Commission for Europe.

Abunge, C, Coulthard, S. and Daw, T. M. (2013) Connecting marine ecosystem services to human well-being: insights from participatory well-being assessment in Kenya. *Ambio*, 42: pp. 1010–1021.

Adams, H. (2016) Why populations persist: mobility, place attachment and climate change, *Population and Environment*, 37: pp. 429-448.

Adams, H. and Adger, W. N. (2013). The contribution of ecosystem services to place utility as a determinant of migration decision-making. *Environmental Research Letters*, 8(1): pp.015006.

Adger, N., Barnett, J., Chapin, F.S.I., Ellemor, H. (2011) This must be the place: under-representation of identity and meaning in climate change decision-making. *Global Environmental Politics*, 11, pp. 1–25.

Adger, W. N. (2000) Social and ecological resilience: are they related? *Progress in Human Geography*, 24(3): pp. 347–364.

Adger, W. N. (2006) Vulnerability. *Global Environmental Change* 16: pp. 268–281.

Adger, W. N. (2016) Place, well-being, and fairness shape priorities for adaptation to climate change. *Global Environmental Change*, 38: pp. A1–A3.

Adger, W. N. and Nelson D. R. (2010) Fair decision making in a new climate of risk. In: O'Brien K. L., Clair, A. L., Kristoffersen, B. (eds) *Climate change, ethics and human security*. Cambridge University Press, Cambridge, pp. 83–94.

Adger, W. N. and Safra de Campos, R. (2020) Climate-change disruptions to migration systems. In: Bastia, T. and Skeldon, R. *Routledge handbook of migration and development*, London UK: Routledge, pp. 382-395.

Adger, W. N., Arnell, N. W. and Tompkins, E. L. (2005a). Successful adaptation to climate change across scales. *Global Environmental Change*, 15(2): pp. 77-86.

Adger, W. N., Barnett, J., Brown, K. et al. (2012) Cultural dimensions of climate change impacts and adaptation. *Nature Climate Change*, 3: pp. 112–117.

Adger, W. N., Dessai, S., Goulden, M. et al. (2009) Are there social limits to adaptation to climate change? *Climatic Change*, 93: pp. 335–354.

Adger, W. N., Paavola, J. and Huq, S. (2006) Toward justice in adaptation to climate change. In: Adger, W. N., Paavola, J., Huq, S., Mace, M. J. (eds) *Fairness in adaptation to climate change*. Cambridge, MA: Massachusetts Institute of Technology, pp. 1–19.

Adger, W. N., Quinn, T., Lorenzoni, I. and Murphy, C. (2016) Sharing the Pain: Perceptions of Fairness Affect Private and Public Response to Hazards, *Annals of the American Association of Geographers*, 106(5): pp. 1079-1096.

Adger, W. N., Safra de Campos, R. and Mortreux, C. (2018) Mobility, displacement and migration, and their interactions with vulnerability and adaptation to environmental risks. In: McLeman, R. and F. Gemene (eds.) *Routledge handbook of environmental displacement and migration* London, UK: Routledge pp. 29-41.

Adler, A. and Seligman, M. E. P. (2016) Using wellbeing for public policy: theory, measurement, and recommendations. *International Journal of Wellbeing*, 6: pp. 1–35.

Agyeman, J., Bulkeley, H. and Nochur, A. (2007) Just climate: towards a reconstruction of climate activism? In: Isham, J. and Wagge S. (eds.) *What You*

*Can Do to Fight Global Warming and Spark a Movement*. Washington, DC: Island. pp. 135–46.

Agyeman, J., Devine-Wright, P. and Prange, J. (2009) Close to the edge, down by the river? Joining up management retreat and place attachment in a climate change world. *Environment and Planning A*, 41: pp. 509–513.

Agyeman, J., Schlosberg, D., Craven L., and Mathews C. (2016) Trends and directions in environmental justice: from inequity to everyday life, community and just sustainabilities. *Annual Review of Environmental Resources*, 41: pp. 321-340.

Aitken, M. (2010) Wind Power and Community Benefits: Challenges and Opportunities. *Energy Policy*, 38(10): pp. 6066–6075.

Ajibade, I. (2019) Planned retreat in Global South megacities: disentangling policy, practice, and environmental justice, *Climatic Change*, 157: pp. 299-317.

Albers, M. J. (2017) *Introduction to Quantitative Data Analysis in the Behavioural and Social Sciences*, Hoboken, USA: Wiley.

Albert, S., Bronen, R., Tooler, N. et al. (2018) Heading for the hills: climate-driven community relocations in the Solomon Islands and Alaska provide insight for a 1.5 °C future. *Regional Environmental Change*, 18: pp. 2261–2272.

Alesina, A., Di Tella, R. and MacCulloch, R. (2004) Inequality and happiness: are Europeans and Americans different? *Journal of Public Economics*, 88: pp. 2009-2042.

Allen, M. (2017) *The sage encyclopedia of communication research methods*, Thousand Oaks, CA: SAGE Publications.

Altman, I. and Low, S. (1992) *Place attachment*. New York: Plenum Press.

Amoako-Johnson, F., Hutton, C. W., Hornby, D., et al (2016) Is shrimp farming a successful adaptation to salinity intrusion? A geospatial associative analysis of

poverty in the populous Ganges-Brahmaputra-Meghna Delta of Bangladesh. *Sustainability Science*, 11(3): pp. 423-439.

Arnall, A. (2014) A climate of control: Flooding, displacement and planned resettlement in the Lower Zambezi River Valley, Mozambique. *The Geographical Journal*, 180: pp. 141–150.

Arnall, A. (2019b) Resettlement as climate change adaptation: what can be learned from state-led relocation in rural Africa and Asia? *Climate and Development*, 11(3): pp. 253-263.

Arnall, A., Hilson, C. and McKinnon, C. (2019a) Climate displacement and resettlement: the importance of claims-making 'from below'. *Climate Policy*, 19:6: pp. 665-671

Arnall, A., Thomas D. S G, Twyman C and Liverman, D. (2013a) Flooding, resettlement, and change in livelihoods: evidence from rural Mozambique. *Disasters*, 37(3): pp. 468-488.

Asif, M. (2000) Why Displaced Persons Reject Project Resettlement Colonies? *Economic and Political Weekly*, 35(24): pp. 2005-2008.

Ayeb-Karlsson, S., Kniveton, D. and Cannon, T. (2020) Trapped in the prison of the mind: Notions of climate-induced (im)mobility decision-making and wellbeing from an urban informal settlement in Bangladesh. *Palgrave Communications* 6(62).

Ayeb-Karlsson, S., Smith, C. D. and Kniveton, D. (2018) A discursive review of the textual use of 'trapped' in environmental migration studies: The conceptual birth and troubled teenage years of trapped populations. *Ambio*, 47: pp. 557–573.

Badri, S. A., Asgary, A., Eftekhari, A. R. and Levy J. (2006) Post-disaster resettlement, development and change: a case study of the 1990 Manjil earthquake in Iran. *Disasters*, 30(4): pp. 451–468.



Baird, I. and Shoemaker, B. (2007) Unsettling experiences: Internal resettlement and international aid agencies in Laos. *Development and Change*, 38: pp. 865–888.

Bala, M. (2006) *The Economics and Politics of Resettlement in India*. Delhi, India: Pearson.

Baldwin, A. (2013). Racialisation and the figure of the climate-change migrant. *Environment and Planning A*, 45: pp. 1474–1490.

Balmford, A. and Bond, W. (2005) Trends in the state of nature and their implications for human well-being. *Ecology Letters*, 8: pp. 1218–1234.

Banai, A., Ronzoni, M. and Schemmel, C. (2011) *Social Justice, Global Dynamics: Theoretical and Empirical Perspectives*. Florence: Taylor and Francis.

Bardsley, D. K. and Hugo, G. J. (2010) Migration and climate change: Examining thresholds of change to guide effective adaptation decision-making. *Population and Environment*, 32: pp. 238–262.

Barnett, J. and McMichael, C. (2018) The effects of climate change on the geography and timing of human mobility, *Population and Environment*, 39: 339–356.

Barnett, J. and O'Neill, S. J. (2012) Islands, resettlement and adaptation. *Nature Climate Change*, 2: pp. 8–10.

Barnett, J. and Webber M. (2009) *Accommodating Migration to Promote Adaptation to Climate Change*, Stockholm: Commission on Climate Change and Development.

Barnett, J., Tschakert, P., Head, L. and Adger, W.N. (2016) A science of loss. *Nature Climate Change*, 6: pp. 976–978.

Barrett, S. (2013) Local level climate justice? Adaptation finance and vulnerability reduction. *Global Environmental Change*, 23: pp. 1819–1829.

Beauchamp, E., Woodhouse, E., Clements, T., et al. (2018) "Living a good life": Conceptualizations of well-being in a conservation context in Cambodia. *Ecology and Society*, 23(2): pp. 28.

Bennett, N. J. and Dearden, P. (2014) Why local people do not support conservation: Community perceptions of marine protected area livelihood impacts, governance and management in Thailand, *Marine Policy*, 44: pp. 107-116

Bennett, N. J., Blythe, J., Cisneros-Montemayor, A.M. et al. (2019) Just Transformations to Sustainability. *Sustainability*, 11: pp. 3881.

Berardo, R. (2013) The Coevolution of Perceptions of Procedural Fairness and Link Formation in Self-Organizing Policy Networks, *The Journal of Politics*, 75(3): pp. 686–700.

Bettini, G. (2013) Climate barbarians at the gate?: A critique of apocalyptic narratives on climate refugees. *Geoforum*, 45: pp. 63–72.

Bidaud, C., Schreckenberg, K., Rabeharison, M., et al. (2017) The sweet and the bitter: intertwined positive and negative social impacts of a biodiversity offset. *Conservation and Society*, 15: pp. 1–13.

Biedenweg, K., Stiles, K. and Wellman, K. (2016) A holistic framework for identifying human wellbeing indicators for marine policy. *Marine Policy*, 64: pp. 31–37.

Biondo, F. (2012) Comparative vs. Transcendental Approaches to Justice: A Misleading Dichotomy in Sen's The Idea of Justice. *An International Journal of Jurisprudence and Philosophy of Law*, 25(4): pp. 555-577.

Biswas-Diener, R. and Diener, E. (2001) 'Making the best of a bad situation: Satisfaction in the slums of Calcutta', *Social Indicators Research*, 55: pp. 329–352.

Black, R. and Collyer, M. (2014) Populations trapped at times of crisis. *Forced Migration Review*, 45: pp. 52–56.

Black, R., Arnell, N. W., Adger, W. N. et al. (2013b) Migration, immobility, and displacement outcomes following extreme events, *Environmental Science and Policy*, 27: pp. S32–S43

Black, R., Kniveton, D. and Schmidt-Verkerk, K. (2013a) Migration and climate change: Toward an integrated assessment of sensitivity. In: Faist, T. and Schade, J. (eds.) *Disentangling migration and climate change*. London, UK: Springer. pp. 29–53.

Black, R., Stephen, R. G. B., Thomas, S. M. and Beddington, J. R. (2011) Climate change: Migration as adaptation, *Nature*, 478(7370): pp. 447–449.

Blaikie, P., Cannon, T., Davis, I., and Wisner, B. (1994) *At Risk: Natural Hazards, People's Vulnerability and Disasters*. London: Routledge.

Boarini, R., Kolev, A. and McGregor, J. A. (2014) Measuring well-being and progress in countries at different stages of development: towards a more universal conceptual framework. *OECD Development Center Working Papers*, 325: pp. 1–59.

Bogardi, J. and Warner, K. (2008). Here comes the flood. *Nature Climate Change*, 2: pp. 9–11.

Booth, A. and Halseth, G. (2011). Why the public thinks natural resources public participation processes fail: A case study of British Columbia communities. *Land Use Policy*, 28: pp. 898–906

Bourke, J. A., Nichols-Dunsmuir, A., Begg, A. et al. (2022) Understanding the longer-term health, wellbeing, and sense of community for disabled people following the 2010–2011 Canterbury earthquakes: A repeated cross-sectional study, *International Journal of Disaster Risk Reduction*, 67: pp. 102649

- Braun, V. and Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2): pp. 77-101
- Breslow, S. J., Allen, M., Holstein, D., et al., (2017) Evaluating indicators of human wellbeing for ecosystem-based management. *Ecosystem Health and Sustainability*, 3: pp. 1–18.
- Breslow, S. J., Sojka, B., Barnea, R., et al. (2016) Conceptualizing and operationalizing human wellbeing for ecosystem assessment and management. *Environmental Science and Policy*, 66: pp. 250-259
- Bronen, R (2008) Alaskan communities' rights and resilience. *Forced Migration Review*, 31: pp. 30–32.
- Bronen, R. (2010) Forced migration of Alaskan indigenous communities due to climate change. In: Afifi, T. and Jager, J. (eds.) *Environment, Forced Migration and Social Vulnerability*, Berlin, Germany: Springer, pp. 87–98.
- Bronen, R. (2011) Climate-induced community relocations: Creating an adaptive governance framework based in human rights doctrine. *New York University Review of Law and Social Change*, 35(2): pp. 356–406.
- Bronen, R. (2013) *Climate-induced displacement of Alaska native communities*, Brookings-LSE: Project on internal displacement.
- Bronen, R. (2015a) Climate displacement preparation and planning. In: Leckie, S. and Huggins, C. (eds.) *Repairing domestic displacement peninsula principles*. New York: Taylor and Francis. pp. 89–110.
- Bronen, R. (2015b) Climate-induced community relocations: Using integrated social–ecological assessments to foster adaptation and resilience, *Ecology and Society* 20: 36.
- Bronen, R. and Chapin, F.S. (2013) Adaptive governance and institutional strategies for climate-induced community relocations in Alaska. *Proceedings of the National Academy of Sciences*, 110(23): pp. 9320-9325.

Brown, K. and Westaway, E. (2011) Agency, capacity, and resilience to environmental change: lessons from human development, well-being, and disasters. *Annual Review of Environmental Resources*, 36 (1): pp. 321–342.

Brown, K., Tompkins, E.L., Adger, W.N. (2002) *Making Waves: Integrating Coastal Conservation and Development*. London: Earthscan.

Brown, S., Nicholls, R. J., Lazar, A. N. et al. (2018) What are the implications of sea-level rise for a 1.5, 2 and 3°C rise in global mean temperatures in the Ganges-Brahmaputra-Meghna and other vulnerable deltas? *Regional Environmental Change*, 18(6): pp.1829-1842.

Bryman, A. (2006) Integrating quantitative and qualitative research: how is it done? *Qualitative Research*, 6: pp. 97–113.

Burgess, H. (2020) Principles of Justice and Fairness. Beyond Intractability. In Burgess, G. and Burgess, H. (Eds.) *Conflict Information Consortium*, University of Colorado, Boulder.

Calliari, E. (2014). 'Loss & damage: A critical discourse analysis' (Working paper). Venice: Fondazione ENI Enrico Mattei and Euro-Mediterranean Center on Climate Change.

Camfield, L., Crivello, G., and Woodhead, M. (2009) Wellbeing Research in Developing Countries: Reviewing the Role of Qualitative Methods. *Social Indicators Research*, 90(1): pp. 5–31.

Camfield, L., Guillen-Royo, M. and Velazco, J. (2010) Does needs satisfaction matter for psychological and subjective wellbeing in developing countries: a mixed-methods illustration from Bangladesh and Thailand. *Journal of Happiness Studies*, 11(4): pp. 497–516.

Campbell, A., Converse, P. E. and Rodgers, W. L. (1976) *The Quality of American Life: Perceptions, Evaluations, and Satisfactions*. New York: Russell Sage Foundation.

Campbell, C. (2010) Climate-induced community relocation in the Pacific: The meaning and importance of land. In McAdam, J. (ed.) *Climate Change and Displacement: Multidisciplinary Perspectives*. Oxford: Hart Publishing. pp. 58–59

Carling, J. (2002) Migration in the age of involuntary immobility: Theoretical reflections and Cape Verdean experiences, *Journal of Ethnic and Migration Studies*, 28(1): pp. 5-42.

Castles, S. (2002) *Environmental change and forced migration: making sense of the debate*. (New issues in refugee research – UNHCR working paper 70). Geneva: UNHCR.

Castles, S. (2008) *Understanding Global Migration: A Social Transformative Perspective*. Conference on Theories of Migration and Social Change at St Anne's College, Oxford 1<sup>st</sup> – 3<sup>rd</sup> July 2008.

Catley, A., Burns, J., Abebe, D. and Suji, O. (2008) *Participatory Impact Assessment. A Guide for Practitioners*. Feinstein International Centre, Boston.

Census of India (2011a) *Ghoramara Population – South Twenty Four Parganas, West Bengal*, Website accessed February 2021  
<<https://www.census2011.co.in/data/village/335238-ghoramara-west-bengal.html>>

Census of India (2011b) *Gangasagar Population, Caste, Working Data South Twenty Four Parganas, West Bengal*, Website accessed February 2021  
<<https://www.censusindia.co.in/villages/gangasagar-population-south-twenty-four-parganas-west-bengal-335274>>

Census of India (2011c) *Bankimnagar Population Census 2011 – 2022*, Website accessed February 2021 <<https://www.census2011.co.in/data/town/272016-bankimnagar-tripura.html>>

Census of India (2011d) *Kamalpur Population Census 2011 – 2022*, Website accessed February 2021 <<https://www.census2011.co.in/data/town/801531-kamalpur-tripura.html>>

Census of India (2011e) *Beguakhali Population - South Twenty Four Parganas, West Bengal*, Website accessed February 2021  
<<https://www.census2011.co.in/data/village/335272-beguakhali-west-bengal.html>>

Census of India (2011f) *Dhablat Population - South Twenty Four Parganas, West Bengal*, Website accessed February 2021  
<<https://www.census2011.co.in/data/village/335281-dhablat-west-bengal.html>>

Centre for Sciences and Environment (CSE) (2016) *Living With Changing Climate: Indian Sundarbans*. New Delhi, India: CSE.

Cernea, M. M. (1997) The risks and reconstruction model for resettling displaced populations. *World Development*, 25(10): pp. 1569–1587.

Cernea, M. M. (2008) Reforming the foundations of involuntary resettlement: introduction, In: Cernea, M. M. and Mathur H. M. (eds.) *Can Compensation Prevent Impoverishment? Reforming Resettlement through Investments*. Oxford: Oxford University Press, pp. 1–8.

Cernea, M. M. and McDowell, C. (2000) *Risks and Reconstruction: Experiences of Resettlers and Refugees*. Washington, D.C.: The World Bank.

Cernea, M. M. and Schmidt-Soltau K. (2006) Poverty risks and national parks: policy issues in conservation and resettlement. *World Development*, 34(10): pp. 1808–1830.

Chakraborty, J., Collins, T. W. and Grineski, S. E. (2016) Environmental justice research: contemporary issues and emerging topics. *International Journal of Environmental Research and Public Health*, 13: 1072.

Chambers, R. (1983) *Rural Development: Putting the Last First*, London: Longman.

Chambers, R. (1997) *'Whose Reality Counts? Putting the Last First'*. London: Intermediate Technology Publications.

Chamlee-Wright, E. and Storr, V. H. (2010) Expectations of government's response to disaster. *Public Choice*, 144: pp. 253–274.

Charan, D., Kaur, M. and Singh, P. (2017) Customary land and climate change induced relocation - a case study of Vunidogoloa Village, Vanua Levu, Fiji. In: Filho, W. L. (ed.) *Climate Change Adaptation in Pacific Countries: Fostering Resilience and Improving the Quality of Life*, Cham: Springer International Publishing, pp. 19-33.

Chen, Y., Tan, Y. and Y. Luo. (2017) Post-disaster resettlement and livelihood vulnerability in rural China. *Disaster Prevention and Management: An International Journal*, 26: pp. 65–78.

Chun, J. M. (2014) Planned Relocations in the Mekong Delta: A successful model for climate change adaptation, a cautionary tale, or both? *Brookings-LSE Project on Internal Displacement*, Washington D.C.: Brookings Institution.

Clark, M. T. (2015) "*Augustine on Justice*" Lexington Books.

Cole, L. W. and Foster, S. R. (2001) *From the Ground Up. Environmental racism and the rise of the environmental justice movement*. New York and London: New York University Press.

Colquitt, J. A., Conlon, D. E., Wesson, M. J. et al. (2001) Justice at the millennium: A meta-analytic review of 25 years of organizational justice research. *Journal of Applied Psychology*, 86: pp. 425–445.

Connell, J. (2016) Last days in the Carteret Islands? Climate change, livelihoods and migration on coral atolls. *Asia–Pacific Viewpoint* 57: pp. 3–15.

Connell, J. and Coelho, S. (2018) Planned relocation in Asia and the Pacific, *Forced Migration Review*, 59: pp.46-49.

Conway, D., Nicholls, R. J., Brown, S. et al. (2019). The need for bottom-up assessments of climate risks and adaptation in climate-sensitive regions. *Nature Climate Change*, 9(7): pp. 503-511.



Correa, E., Ramirez, F. and Sanahuja, H. (2011) *Populations at Risk of Disaster: A Resettlement Guide*. Washington, DC: World Bank

Costanza, R., Hart, M., Posner, S. and Talberth, J. (2009). *Beyond GDP: The need for new measures of progress*. The Pardee Papers, Boston University, Boston, MA.

Cummings, C. L. (2017) Cross-Sectional Design. In Allen, M. (ed.) *The SAGE Encyclopedia of Communication Research Methods*. Thousand Oaks, California: SAGE Publications.

Cummins, R. A. (1996) The Domains of Life Satisfaction: An attempt to order chaos, *Social Indicators Research*, 38: pp. 303-328.

Cummins, R. A. (1998) The Second Approximation to an International Standard for Life Satisfaction, *Social Indicators Research* 43: 307-334.

Cundill, G., Singh, C., Adger, W. N. et al., (2021) Toward a climate mobilities research agenda: Intersectionality, immobility, and policy responses, *Global Environmental Change*, 69: pp. 102315

Curry, G.N., Koczberski, G., Lummani, J. et al. (2015) A bridge too far? The influence of socio-cultural values on the adaptation responses of smallholders to a devastating pest outbreak in cocoa. *Global Environmental Change*, 35: pp. 1–11.

Cutter, S., Osman-Elasha, B., Campbell, J. et al. (2012) Managing the Risks from Climate Extremes at the Local Level. In: Field, C. B., Barros, V., Stocker, T. F. et al. *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*. Cambridge: Cambridge University Press, pp. 291-338.

Danda, A. A., Ghosh, N., Bandyopadhyay, J. and Hazra, S. (2019) Managed retreat: adaptation to climate change in the Sundarbans ecoregion in the Bengal Delta, *Journal of the Indian Ocean Region*, 15(3): pp. 317 – 335.

- Das, S. and Hazra, S. (2020) Trapped or resettled: coastal communities in the Sundarbans Delta, India. *Forced Migration Review*, 64: pp. 15-17.
- Dastagir, M. R. (2015) Modelling recent climate change induced extreme events in Bangladesh: A review. *Weather and Climate Extremes*, 7: pp. 49-60.
- Dawson, N. and Martin, A. (2015) Assessing the contribution of ecosystem services to human wellbeing: a disaggregated study in western Rwanda. *Ecological Economics*, 117: pp. 62-72.
- de Haas, H. (2005). International migration, remittances and development: Myths and facts. *Third World Quarterly*, 26(8): pp. 1269–1284.
- de Sherbinin, A., Castro, M., Gemenne, F., et al. (2011a) Climate change. Preparing for resettlement associated with climate change, *Science*, 334: pp. 456–457.
- de Sherbinin, A., Warner, K. and Ehrhart. C. (2011b) Casualties of climate change, *Scientific American*, 304: pp. 50–57.
- De Silva, D. and Yamao, M. (2007) Effects of the tsunami on fisheries and coastal livelihood: a case study of tsunami-ravaged southern Sri Lanka. *Disasters*, 31(4): pp. 386–404.
- De Souza, K., Kituyi, E., Harvey, B. et al. (2015) Vulnerability to climate change in three hot spots in Africa and Asia: key issues for policy-relevant adaptation and resilience-building research. *Regional Environmental Change* 15: pp. 747–753
- de Vente, J., Reed, M. S., Stringer, L. C. et. al. (2016). How does the context and design of participatory decision making processes affect their outcomes? Evidence from sustainable land management in global drylands. *Ecology and Society*, 21: pp. 24.
- Delang, C., and Toro, M. (2011) Hydropower-induced displacement and resettlement in the Lao PDR. *South East Asia Research*, 19: pp. 567–594.

Deltares (2008) *Towards sustainable development of deltas, estuaries and coastal zones*, Report on Trends and responses, prepared for the Aquaterra 2009 Conference.

Deneulin, S. and McGregor, J. A. (2010) The capability approach and the politics of a social conception of wellbeing, *European Journal of Social Theory*, 13(4): pp. 501–519.

Dickinson, D. and Webber, M. (2007) Environmental resettlement and development, on the steppes of Inner Mongolia, PRC. *The Journal of Development Studies*, 43: pp. 537–561.

Diener, E. (1984) Subjective well-being. *Psychological Bulletin*, 95(3): pp. 542–575.

Diener, E. and Tov, W. (2007) Culture and Subjective Well-Being. In: by Kitayama, S. and Cohen, D. (ed.) *Handbook of Cultural Psychology*. New York: Guilford Press, pp. 691-713.

Diener, E., Sapyta, J. J. and Suh, E. (1998) Subjective Well-Being Is Essential to Well-Being. *Psychological Inquiry*, 9(1): pp. 33–37.

Diener, E., Scollon, C. N. and Lucas, R. E. (2003) The evolving concept of subjective well-being: The multifaceted nature of happiness. In: Costa, P. T. and Siegler, I. C. (eds.) *The psychology of aging*. New York, NY: Elsevier Science.

Dietz, S. and G. Atkinson. (2005) Public perceptions of equity in environmental policy: Traffic emissions policy in an English urban area. *Local Environment*, 10 (4): pp. 445–59.

Dobson, A. (1998) *Justice and the environment: Conceptions of environmental sustainability and dimensions of social justice*. Oxford, UK: Oxford University Press

Douglas, M. and Ney, S. (1998), *Missing Persons: A Critique of the Social Sciences*, Berkeley: University of California Press.

Duraiappah, A. K. (2004) *Exploring the linkages: Human wellbeing, poverty and ecosystem services*. Manitoba: United Nations Environment Programme and the International Institute for Sustainable Development.

Easterlin, R., McVey, L. A., Switek, M., et. al. (2010) The happiness-income paradox revisited. *Proceedings of the National Academy of Sciences*, 107(52): pp. 22463-22468.

Epstein, G. (2017) Local rulemaking, enforcement and compliance in state-owned forest commons. *Ecological Economics*, 131: pp. 312–321.

Fabinyi, M., Foale, S. and Macintyre, M. (2013) Managing inequality or managing stocks? An ethnographic perspective on the governance of small-scale fisheries. *Fish and Fisheries*, 16 (3): pp. 471–485.

Farber, D. A. (2008) The Case for Climate Change Compensation: Justice for Climate Change Victims in a Complex World, *Utah Law Review*, pp. 377-413.

Farbotko, C. and Lazrus, H. (2012) The first climate refugees? Contesting global narratives of climate change in Tuvalu. *Global Environmental Change*, 22: pp. 382–390.

Farbotko, C., Stratford, E. and Lazrus, H. (2015). Climate migrants and new identities? The geopolitics of embracing or rejecting mobility. *Social and Cultural Geography*, 17: pp. 1-20.

Fekete, A. and Sakdapolrak, K. (2014) Loss and damage as an alternative to resilience and vulnerability? Preliminary reflections on an emerging climate change adaptation discourse. *International Journal of Disaster Risk Science*, 5(1): pp. 88–93

Felli, R. (2013) Managing climate insecurity by ensuring continuous capital accumulation: ‘climate refugees’ and ‘climate migrants. *New Political Economy*, 18(3): pp. 337–363.

Fernandes, W. (2008) 'India's forced displacement policy and practice: Is compensation up to its function?' In: *Can compensation prevent impoverishment?* M. Cernea and H.M. Mathur (eds) New Delhi: Oxford University Press.

Ferris, E. (2015) Climate-induced resettlement: Environmental change and the planned relocation of communities. *SAIS Review of International Affairs Winter–Spring*, 35: pp. 109–117.

Ferris, E. and Weerasinghe, S. (2020) Promoting Human Security: Planned relocation as a Protection Tool in a Time of Climate Change, *Journal on Migration and Human Security*, 8(2): pp. 134 – 149.

Ferris, E., (2011) Planned relocations, disaster and climate change, in: *Conference on Climate Change and Migration in the Asia–Pacific: Legal and Policy Responses*, Sydney, 10<sup>th</sup> – 11<sup>th</sup> November 2011.

Folke, C., Carpenter, S., Elmqvist, T., et al. (2002) Resilience and sustainable development sustainable development: building adaptive capacity in a world of transformations. *Ambio*, 31: pp. 437–440.

Foresight (2011) *Final project report – foresight: Migration and global environmental change*. London: Government Office for Science

Forgeard, M. J. C. (2011) Doing the right thing: Measuring wellbeing for public policy, *International Journal of Wellbeing*, 1(1): pp. 79–106.

Forsyth, T. (2014) Climate justice is not just ice. *Geoforum*, 54: pp. 230–232.

Fraser, E. D. G., Mabee, W., and Slaymaker, O. (2003) Mutual vulnerability, mutual dependence: The reflexive relation between human society and the environment, *Global Environmental Change*, 13(2): pp. 137–144.

Freund, R. J., Wilson, W. J., and Mohr, D. L. (2010) Chapter 14. Nonparametric Methods. In: Freund, R. J., Wilson, W. J., and Mohr, D. L. (eds.) *Statistical Methods* (Third Edition). Academic Press, pp. 689-719.

Friedman, R. S., Law, E. A., Bennett, N. J., et al. (2018) How just and just how? A systematic review of social equity in conservation research. *Environmental Research Letters*, 13 (5): 053001.

Galliard, J. C. (2010) Vulnerability, capacity and resilience: Perspectives for climate and development policy. *Journal of International Development*, 22: pp. 218–232.

Garikpati, S. (2002) Resettlement Sites of Narmada Valley Project: Some Revealing Insights. *Economic and Political Weekly*, 37(23): pp. 2257-2266.

Gasper, D. (2010) Understanding the diversity of conceptions of well-being and quality of life, *Journal of Socio-Economics*, 39(3): pp. 351-360.

Gesing, F., Herbeck J. and Klepp, S. (2014) *Denaturalizing climate change: migration, mobilities and spaces*, Bremen: University of Bremen

Ghosh, T., Hajra, R., and Mukhopadhyay, A. (2014) Island erosion and afflicted population: Crisis and policies to handle climate change. In: Filho, W. L. (ed.) *International perspectives on climate change*. Berlin, Germany: Springer pp. 217–225.

Giosan, L, Syvitski, J, Constantinescu, S, et al. (2014) Climate change: protect the world's deltas. *Nature*, 516: pp. 31–33.

Gonzalez, C., and Simon, J. (2008) All that glitters is not gold: Resettlement, vulnerability, and social exclusion in the Pehuenche Community Ayin Mapu, Chile. *American Behavioral Scientist*, 51: pp. 1774–1789.

Gough, I. and McGregor, J. A. (2007) *Wellbeing in developing countries: from theory to research*. Cambridge University Press, Cambridge

Gough, I., McGregor, J.A. and Camfield, L. (2007) Theorizing wellbeing in international development In: Gough, I. and McGregor, J. A. (eds) *Wellbeing in Developing Countries: From Theory to Research*. Cambridge, UK: Cambridge University Press.

Gowan, M. E., Kirk, R. C. and Sloan, J. A. (2014) Building resiliency: a cross-sectional study examining relationships among health-related quality of life, well-being, and disaster preparedness, *Health and Quality of Life Outcomes*, 12: 85

Gray, D. E. (2017) *Doing Research in the Real World*, 4th edition, Greenwich, UK: Sage Publications.

Greene, J. C. (2007) *Mixed methods in social inquiry*. San Francisco, USA: Jossey-Bass.

Groen, J. A. and Polivka, A. E. (2010) Going home after Hurricane Katrina: Determinants of return migration and changes in affected areas. *Demography*, 47(4): pp. 821–844.

Gromilova, M. (2014) Revisiting Planned Relocation as a Climate Change Adaptation Strategy: The Added Value of a Human Rights-Based Approach, *Utrecht Law Review*, 10(1): pp. 76-95.

Gross, C. (2007) Community Perspectives of Wind Energy in Australia: The Application of a Justice and Community Fairness Framework to Increase Social Acceptance. *Energy Policy*, 35 (5): pp. 2727–2736.

Gross-Camp, N. (2017) Tanzania's community forests: Their impact on human well-being and persistence in spite of the lack of benefit. *Ecology and Society*, 22(1): 37.

Hajra, R. and Ghosh, T. (2018) Agricultural productivity, household poverty and migration in the Indian Sundarban Delta. *Science of the Anthropocene* 6(1): 3.

Hall, J. and Rickard, L. (2013) *People, Progress and Participation: How Initiatives Measuring Social Progress Yield Benefits Beyond Better Metrics*, Global Choices 1, BertelsmannStiftung.

Hamilton, M. (2018) Understanding what shapes varying perceptions of the procedural fairness of transboundary environmental decision-making processes, *Ecology and Society*, 23(4): pp. 48.

Hang Bui, T. and P. Schreinemachers. (2011) Resettling farm households in northwestern Vietnam: Livelihood change and adaptation. *International Journal of Water Resources Development*, 27: pp. 769–785.

Hawtin, M. and Percy-Smith, J. (2007) *Community profiling. A practical guide*. Second edition. England: Open University Press.

Hazra, S. and Samanta, K. (2016) *Temporal change detection (2001-2008). Study of Sundarban. School of Oceanographic Studies*, Kolkata: University of Jadavpur.

Heine, B. and Petersen, L. (2008) Adaptation and cooperation, *Forced Migration Review*, 31: pp. 48–50.

Helliwell, J. F. (2003) How's life? Combining individual and national variables to explain subjective well-being. *Economic Modelling*, 20(2): pp. 331–360

Helne, T. and Hirvilammi, T. (2015) Wellbeing and sustainability: a relational approach. *Sustainable Development*, 23: pp. 167–175.

Hess, J. J., Malilay, J. N. and Parkinson, A. J. (2008) Climate change: The importance of place. *American Journal of Preventative Medicine*, 35: pp. 468–478

Hino, M., Field, C. B. and Mach, K. J. (2017) Managed retreat as a response to natural hazard risk, *Nature Climate Change*, 7(5): pp. 364-370.

Hiscock, R., Asikainen, A, Tuomisto, J. et al. (2017) City scale climate change policies: Do they matter for wellbeing? *Preventive Medicine Reports*, 6(C): pp. 265-270.

Holland, B. (2017) Procedural justice in local climate adaptation: political capabilities and transformational change. *Environmental Politics*, 26 (3): pp. 391–412.



Homewood, K., Rowcliffe, M., de Leeuw, J. et al. (2019) Pastoralism, conservation and resilience: causes and consequences of pastoralist household decision-making. *Agricultural Resilience*, 180.

Hossain, M. S., Dearing, J. A., Rahman, M. M., et al. (2016) Recent changes in ecosystem services and human well-being in the Bangladesh coastal zone. *Regional Environmental Change*, 16: pp. 429–443.

Hossain, M. S., Uddin, M. J. and Fakhruddin, A. N. M. (2013) Impacts of shrimp farming on the coastal environment of Bangladesh and approach for management. *Reviews in Environmental Science and Bio/Technology*, 12(3): pp. 313-332.

Hugo, G. (1996) Environmental concerns and migration, *International Migration Review*, 30(1): pp. 105–131.

Hugo, G. (2010) Climate change-induced mobility and the existing migration regime in Asia and the Pacific. In: McAdam, J. (ed.), *Climate Change and Displacement: Multidisciplinary Perspectives*. New York: Oxford University Press, pp. 9.36.

IDMC (Internal Displacement Monitoring Centre) (2021) *Internal displacement in a changing climate*, Norwegian Refugee Council.

IDMC (Internal Displacement Monitoring Centre) (2021) *Country Profile: India*. Website accessed October 2022 <<https://www.internal-displacement.org/countries/india>>

Igor, K. (2005) Attachment and identity as related to a place and its perceived climate. *Journal of Environmental Psychology*, 25: 207–218.

Ikeme, J. (2003) Equity, environmental justice and sustainability: incomplete approaches in climate change politics. *Global Environmental Change*, 13(3): pp. 195–206.

India Meteorological Department (2020) *Monsoon Season 2019*. Website accessed February 2021 <<https://www.imdpune.gov.in/>>

IPCC (Intergovernmental Panel on Climate Change) (2007) Appendix I: Glossary. In: Parry, M. L., Canziani, O. F., Palutikof, J. P., et al. (eds.), *Contribution of working group II to the fourth assessment report of the intergovernmental panel on climate change*, Cambridge: Cambridge University Press, pp. 869–884.

IPCC (Intergovernmental Panel on Climate Change) (2014) Summary for policymakers. In: Field, C. B., Barros, V. R., Dokken, D. J. et al. (eds.) *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge: Cambridge University.

IPCC (Intergovernmental Panel on Climate Change) (2022) Summary for policymakers. In: Portner, H. O., Roberts, D. C., Tignor, M. M. B. et al. (eds.) *Climate Change 2022: Impacts, Adaptation, and Vulnerability. Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, Switzerland: IPCC.

Irrigation and Waterways Department (2014) *Annual Flood Report for the Year 2014*. Irrigation and Waterways Directorate, Government of West Bengal. Website accessed September 2018 <[http://wbiwd.gov.in/pdf/ANNUAL\\_FLOOD\\_REPORT\\_2014.pdf](http://wbiwd.gov.in/pdf/ANNUAL_FLOOD_REPORT_2014.pdf)>.

Islam, S. N., Singh, S., Shaheed, H. et al. (2010) Settlement relocations in the char-lands of Padma River basin in Ganges delta, Bangladesh. *Frontiers of Earth Science in China*, 4(4): pp. 393-402.

Kahneman, D. (2003) *Puzzles of well-being*. Paper presented at the annual meeting of the American Economics Association, Washington, DC

Kahneman, D., Diener, E. and Schwarz, N. (1999) *Well-Being: The Foundations of Hedonic Psychology*. New York: Russell Sage Found.

Kates, R. W. (2000) Cautionary tales: Adaptation and the global poor. *Climatic Change*, 45: pp. 5-17.

Kaufmann, D. and Penciakova, V. (2011) Japan's Triple Disaster; Governance and the Earthquake, Tsunami and Nuclear Crises. Brookings Institute, 16<sup>th</sup> March 2011.

Ke, X., Liu, C. and Li, N. (2010) Social support and Quality of Life: a cross-sectional study on survivors eight months after the 2008 Wenchuan earthquake. *BMC Public Health*, 10: 573.

Kelly, P. M. and Adger, W. N. (2000) Theory and practice in assessing vulnerability to climate change and facilitating adaptation. *Climatic Change*, 47(4): pp. 325–352.

Khan, M. R., Huq, S., Risha, A. N. et al (2021) High-density population and displacement in Bangladesh. *Science*, 372 (6548): pp. 1290-1293.

King, A. P. and Eckersley, R. J. (2019) Inferential Statistics III: Nonparametric Hypothesis Testing, in *Statistics for Biomedical Engineers and Scientists*, Academic Press

Kingston, D. and Marino, E. (2010) Twice removed: King Islanders' experience of "Community" through two relocations. *Human Organization*, 69: pp. 119–128.

Klinsky, S., Roberts, T., Huq, S. et al. (2016) Why equity is fundamental in climate change policy research. *Global Environmental Change*, 44: pp. 170–173

Koenig, D. (2005) Enhancing local development in development-induced displacement and resettlement projects'. In: Wet, C.D. (ed.) *Development-Induced Displacement: Problems, Policies and People*. Oxford: Berghahn Books. pp. 105–140.

Kolkata Port Trust (2018) *A Background Note on Development of Port Facilities at Sagar Island*. Kolkata Port Trust, Ministry of Shipping, Government of India.

Website accessed September 2018,

<<http://kolkataporttrust.gov.in/showfile.php?layout=1&lid=909>>

Kothari, U. (2014) Political discourses of climate change and migration: resettlement policies in the Maldives. *The Geographical Journal*, 180: pp. 130–140.

Kura, Y., Joffre, O., Laplante, B. and Sengvilaykham, B. (2017) Coping with resettlement: a livelihood adaptation analysis in the Mekong River basin. *Land Use Policy*, 60: pp. 139–149.

Laerd (2022a) *Wilcoxon Signed-Rank Test SPSS Statistics*. Website accessed January 2021 < <https://statistics.laerd.com/premium/spss/wsr/wilcoxon-signed-rank-test-in-spss.php>>

Laerd (2022b) *Sign Test SPSS Statistics*. Website accessed January 2021 < <https://statistics.laerd.com/premium/spss/st/sign-test-in-spss.php>>

Laerd (2022c) *Kruskal-Wallis H Test SPSS Statistics*. Website accessed January 2021 < <https://statistics.laerd.com/premium/spss/kwht/kruskal-wallis-test-in-spss.php>>

Lai Ming, L. and Saumik. P. (2013) Displacement and erosion of informal risk-sharing: Evidence from Nepal. *World Development*, 43: pp. 42–55.

Lau, J. D., Gurney, G. G. and Cinner, J. (2021a). Environmental justice in coastal systems: Perspectives from communities confronting change. *Global Environmental Change*, 66: 102208.

Lau, J. D., Song, A. M., Morrison, T., et al. (2021b). Morals and climate decision-making: Insights from social and behavioural sciences. *Current Opinion in Environmental Sustainability*, 52: pp. 27–35.

Leach, W. D., and Sabatier, P. A. (2005) To trust an adversary: integrating rational and psychological models of collaborative policymaking. *American Political Science Review*, 99(4): pp. 491-503.

- Lecuyer, L., White, R. M., Schmook, B., et al. (2018) The construction of feelings of justice in environmental management: An empirical study of multiple biodiversity conflicts in Calakmul. *Journal of Environmental Management*, 213: pp. 363–373.
- Lehmann, I., Martin, A. and Fisher, J. A. (2018) Why Should Ecosystem Services Be Governed to Support Poverty Alleviation? Philosophical Perspectives on Positions in the Empirical Literature. *Ecological Economics*, 149: pp. 265–273.
- Leichenko, R. M. and O'Brien, K. L. (2002) The dynamics of rural vulnerability to global change: the case of southern Africa, *Mitigation and Adaptation Strategies for Global Change*, 7(1): pp. 1–18.
- Leventhal, G. (1980) What should be done with equity theory? New approaches to the study of justice in social relationships. In Gergen, M. S. and Greenberg, R. W. (eds.) *Social exchange theory*. New York: Plenum.
- Levi, M., Sacks, A. and Tyler, T. (2009) Conceptualizing legitimacy, measuring legitimating beliefs. *American Behavioural Scientist*, 53: pp. 354–375.
- Lind, E. A. and Tyler, T. R. (1988) *The social psychology of procedural justice*. Springer Science & Business Media.
- Lindegaard, L. S. (2020) Lessons from climate-related planned relocations: the case of Vietnam, *Climate and Development*, 12(7): pp. 600-609.
- Lipset, D. (2013) The new state of nature: Rising sea-levels, climate justice, and community-based adaptation in Papua New Guinea (2003–2011). *Conservation and Society*, 11: pp. 144–158.
- Liu, L., Bouman, T., Perlaviciute, G. and Steg, L. (2020) Public participation in decision making, perceived procedural fairness and public acceptability of renewable energy projects, *Energy and Climate Change*, 1(100013): pp. 2666-2787.

Löfgren, H. (2016) The communist party of India (Marxist) and the left government in West Bengal, 1977-2011: strains of governance and socialist imagination. *Studies in Indian Politics*, 4: pp. 102–115.

Lokot, M. (2021) 'Whose Voices? Whose Knowledge? A Feminist Analysis of the Value of Key Informant Interviews', *International Journal of Qualitative Methods*. 20(2): pp. 1-8.

Loomis, D. K. and Ditton, R. B. (1993) Distributive justice in fisheries management. *Fisheries*, 18: pp. 14–18.

Loveridge, R., Sallu, S. M., Pasha, I. J. et al., (2020) Measuring human wellbeing: A protocol for selecting local indicators, *Environmental Science and Policy*, 114: pp. 461-469.

Lubkemann, S. C. (2008) Involuntary Immobility: On a Theoretical Invisibility in Forced Migration Studies, *Journal of Refugee Studies*, 21(4): pp. 454–475.

MacCoun, R. J. (2005) Voice, Control, and Belonging: The Double-Edged Sword of Procedural Fairness. *Annual Review of Law and Social Science*, 1(1): pp. 171-201.

MacKellar, F. L., Lutz, W., McMichael, A. J., and Suhrke, A. (1998) Population and climate change. In: Rayner, S. and Malone, E. L. (eds.) *Human Choice and Climate Change*. Columbus: Battelle Press, pp. 89–194.

Mahali et al. (2018) Networks of Well-being in the Global South: A Critical Review of Current Scholarship, *Journal of Developing Societies*, 34(4): pp. 373-400.

Maguire, L. and Lind, E. (2003) Public participation in environmental decisions: stakeholders, authorities and procedural justice. *International Journal of Global Environmental Issues*, 3(2): pp. 133–148.

Maiese, M. and Burgess H. (2020) Types of Justice. Beyond Intractability. In: Burgess, G. and Burgess, H. (eds.) *Conflict Information Consortium*. Boulder: University of Colorado.

Maldonado, J. K., Shearer, C., Bronen, R. et al. (2013) The impact of climate change on tribal communities in the US: displacement, relocation, and human rights. In: Maldonado, J. K., Colombi, B., Pandya, R. (eds) *Climate Change and Indigenous Peoples in the United States*. Cham: Springer.

Manatunge, J., Takesada, N., Miyata, S. and Herath, L. (2009) Livelihood rebuilding of dam-affected communities: Case studies from Sri Lanka and Indonesia. *International Journal of Water Resources Development*, 25: pp. 479–489

Manning, N. (2001) The legacy of the New Public Management in developing countries. *International Review of Administrative Sciences*, 67: pp. 297–312

Marino, E. (2012) The long history of environmental migration: assessing vulnerability construction and obstacles to successful relocation in Shishmaref, Alaska. *Global Environmental Change*, 22: pp. 374–381.

Markowitz, E. M., Grasso, M., and Jamieson, D. (2015) Climate ethics at a multidisciplinary crossroads: Four directions for future scholarship. *Climatic Change*, 130: pp. 465–474.

Martin, A., Coolsaet, B., Corbera, E., et al. (2016) Justice and conservation: The need to incorporate recognition. *Biological Conservation*, 197: pp. 254– 261.

Martin, A., Gross-Camp, N., and Akol, A. (2015). Towards an explicit justice framing of the social impacts of conservation. *Conservation and Society*, 13: pp. 166–178.

Martin, A., Gross-camp, N., Kebede, B., et al. (2014) Whose environmental justice? Exploring local and global perspectives in a payments for ecosystem services scheme in Rwanda. *Geoforum*, 54: pp. 167–177.

Martin, A., McGuire, S. and Sullivan, S. (2013) Global environmental justice and biodiversity conservation. *The Geographical Journal*, 179: pp. 122–131.

Martin, P. C. M., Nunn, P. D., Leon, J. and Tindale, N. (2018) Responding to multiple climate-linked stressors in a remote island context: The example of Yadua Island, Fiji. *Climate Risk Management*, 21: pp. 7–15.

Mathews, G. (2012) Happiness, culture, and context. *International Journal of Wellbeing*, 2(4): pp. 299-312.

Mathur, H. M. (2008) Mining coal, undermining people: compensation policies and practices of Coal India. In Cernea, M. M. and Mathur, H. M. (eds.) *Can Compensation Prevent Impoverishment? Reforming Resettlement through Investments*. Oxford: Oxford University Press, pp. 260–285.

Mathur, H. M. (2013) *Displacement and resettlement in India: The human cost of development*. London: Routledge.

McAdam, J. and Ferris, E. (2015) Planned relocations in the context of climate change: Unpacking the legal and conceptual issues. *Cambridge Journal of International and Comparative Law*, 4: pp. 137–166.

McDonald-Wilmsen, B. (2009) Development-induced displacement and resettlement: Negotiating fieldwork complexities at the Three Gorges Dam, China. *The Asia Pacific Journal of Anthropology*, 10(4): pp.283-300.

McGillivray, M. and Clarke, M. (2006) *Understanding human well-being*. United Nations University Press.

McGregor, J. A. (2004) Researching Well-Being: Communicating between the Needs of Policy Makers and the Needs of People, *Global Science Policy*, 4(3): pp. 337–358.

McGregor, J. A. (2007) Researching human wellbeing: From concepts to methodology. In: Gough, I. and McGregor, J. A. (eds.) *Wellbeing in Developing Countries: From Theory to Research*, Cambridge: Cambridge University Press, pp. 316–350.



McGregor, J. A. (2008) *Wellbeing, poverty and conflict*, WeD Policy Briefing 01/08.

McGregor, J. A. (2018) Reconciling Universal Frameworks and Local Realities in Understanding and Measuring Wellbeing. In: Bache, I. and Scott, K. (eds.) *The Politics of Wellbeing. Wellbeing in Politics and Policy*. Cham: Palgrave Macmillan.

McGregor, J. A. and Pouw, N. (2017) Towards an economics of well-being. *Cambridge Journal of Economics*, 41: pp. 1123–1142.

McGregor, J. A. and Sumner, A. (2010) Beyond Business as Usual: What Might 3-D Wellbeing Contribute to MDG Momentum. *IDS Bulletin*, 41(1): pp. 104–112.

McGregor, J. A. and Sumner, A. (2010) *Beyond business as usual: What might 3-D wellbeing contribute to MDG momentum?*, *IDS Bulletin*, 41(1): pp. 104–12.

McGregor, J. A., Camfield, L. and Coulthard, S. (2015b) Competing Interpretations: Human Wellbeing and the Use of Quantitative and Qualitative Methods. In: Roelen, K. and Camfield, L. (eds.) *Mixed Methods Research in Poverty and Vulnerability*. London: Palgrave Macmillan.

McGregor, J. A., Camfield, L. and Woodcock, A. (2009) Needs, Wants and Goals: Wellbeing, Quality of Life and Public Policy. *Applied Research in Quality of Life*, 4(2): pp. 135-154.

McGregor, J. A., Coulthard, S. and Camfield, L. (2015a) Measuring what matters: the role of wellbeing methods in development policy and practice. *Development Progress project note 4*. London, UK: Overseas Development Institute.

McLeman, R. and Smit, B. (2006) Migration as an adaptation to climate change. *Climatic Change*, 76(1–2): pp. 31–53.

McMichael, C., Farbotko, C and McNamara, K.E. (2018) Climate-migration responses in the Pacific region. In: Menjívar, C., Ruiz, M. and Ness, I. (eds.) *The Oxford Handbook of Migration Crises*. Oxford: Oxford University Press.

McMichael, C., Katonivualiku, M. and Powell, T. (2019) Planned Relocation and Everyday Agency in Low-lying Coastal Villages in Fiji. *The Geographical Journal*, 185(3): pp. 325–37.

McNamara, K. E. (2014) Exploring loss and damage at the international climate change talks. *International Journal of Disaster Risk Science*, 5(3): pp. 242–246.

McNamara, K. E. and Gibson, C. (2009) We do not want to leave our land: Pacific ambassadors at the United Nations resist the category of “climate refugees”. *Geoforum*, 40: pp. 475–483

McNamara, K. E., and des Combes, H. E. (2015) Planning for Community Relocations Due to Climate Change in Fiji. *International Journal of Disaster Risk Science*, 6: pp. 315–319.

McNamara, K. E., Bronen, R., Fernando, N. and Klepp, S. (2018) The complex decision-making of climate-induced relocation: adaptation and loss and damage, *Climate Policy*, 18(1): pp. 111-117.

McShane, K. (2017) Values and harms in loss and damage. *Ethics Policy and Environment*, 20: pp. 129–214

Mechler, R., Singh, C., Ebi, K. et al. (2020) Loss and Damage and limits to adaptation: recent IPCC insights and implications for climate science and policy, *Sustainability Science*, 15: pp. 1245-1251.

Methmann, C. and Oels, A. (2015) From ‘saving’ to ‘empowering’ climate refugees: Rendering climate-induced migration governable through resilience. *Security Dialogue*, 46(1): pp. 51–68.

Michalos, A. C. (1997) Combining social, economic and environmental indicators to measure sustainable human well-being, *Social Indicators Research*, 40: pp. 221- 258.

Milan, A. and Ruano, S. (2014) Rainfall variability, food insecurity and migration in Cabricán, Guatemala, *Climate and Development*, 6(1): pp. 61-68

Millennium Ecosystem Assessment (2005) *Ecosystems and human well-being: synthesis*. Washington, DC: Island Press.

Miller, A. and Listhaug, O. (1999) Political performance and institutional trust. In: Norris (ed.), *Critical citizens*. Oxford: Oxford University Press.

Miller, F. (2020) Exploring the consequences of climate-related displacement for just resilience in Vietnam. *Urban Studies*, 57(7): pp. 1570-1587.

Miller, F. and Dun, O. (2019) Resettlement and the environment in Vietnam: Implications for climate change adaptation planning. *Asia Pacific Viewpoint*, 60(2): pp. 132-147.

Ministry of Environment and Forests (2011) Coastal Regulation Zone Notification. Ministry of Environment and Forests, Department of Environment, Forests and Wildlife. Website accessed September 2018, <<http://www.moef.nic.in/downloads/publicinformation/CRZ-Notification-2011.pdf>>

Ministry of Law and Justice (2005) *National Disaster Management Act*. Website accessed September 2021. Ministry of Law and Justice, Legislative Department. <[http://www.ndma.gov.in/images/ndma-pdf/DM\\_act2005.pdf](http://www.ndma.gov.in/images/ndma-pdf/DM_act2005.pdf)>

Ministry of Law and Justice (2013) The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act. Ministry of Law and Justice, Legislative Department. Website accessed September 2021, <<http://indiacode.nic.in/acts-in-pdf/302013.pdf>>

Ministry of Rural Development (2007) National Rehabilitation and Resettlement Policy. Ministry of Rural Development, Department of Land Resources, Land Reforms Division. Website accessed September 2021, <<http://www.dolr.nic.in/nrrp2007.pdf>>

Modi, R. (2004) Sardar Sarovar Oustees: Coping with Displacement. *Economic and Political Weekly*, 39(11): pp. 1123-1126.

Mohai, P., Pellow, D. and Timmons Roberts, J. (2009) Environmental justice. *Annual Review of Environmental Resources*, 34: pp. 405–430.

Mooney, H., Cropper, A. and Reid, W. (2005) Confronting the human dilemma: how can ecosystems provide sustainable services to benefit society? *Nature*, 434: pp. 561–562.

Morrissey, J. and Oliver-Smith, A. (2013) *Perspectives on non-economic loss and damage: understanding values at risk from climate change*. The Loss and Damage in Vulnerable Countries Initiative

Mortreux, C., Safra de Campos, R., Adger, W. N., Ghosh, T., Das, S., Adams, H., & Hazra, S. (2018) Political economy of planned relocation: A model of action and inaction in government responses, *Global Environmental Change*, 50: pp. 123–132.

Mteki, N., Murayama, T. and Nishikizawa, S. (2017) Social impacts induced by a development project in Tanzania: A case of airport expansion. *Impact Assessment and Project Appraisal*, 35: pp. 272–283.

Mukhopadhyay, A. (2009) On the wrong side of the fence: embankment people and social justice in the Sundarbans. In: Bose, P.K. and Das, S.K. (eds.), *Social Justice and Enlightenment: West Bengal*. New Delhi: Sage.

Myers, N. (2002) Environmental refugees: a growing phenomenon of the 21st century. *Philosophical Transactions of the Royal Society London: Biological sciences: Series B*, 357(1420): pp. 609–613.

Myers, N. (2005) *Environmental refugees: An emergent security issue*, 13th Economic Forum, Prague, May 2005

Naeem, S., Bunker, D.E., Hector, A., Loreau, M. and Perrings, C. (2009) *Biodiversity, ecosystem functioning, and human wellbeing: an ecological and economic perspective*. Oxford: OUP.

Nandi, S., Ghosh, M., Kundu, A. et al. (2016) Shoreline shifting and its prediction using remote sensing and GIS techniques: a case study of Sagar Island, West Bengal (India) *Journal of Coastal Conservation*, 20: pp. 61-80.

Narayan, D., Chambers, R., Shah, M.K. and Petesch, P. (2000) *Voices of the Poor: Crying Out for Change*. New York: Oxford University Press.

Naser, M. M., Swapan, M. S. H., Ahsan, R. et al. (2019) Climate change, migration and human rights in Bangladesh: Perspectives on governance. *Asia Pacific Viewpoint*, 60(2): pp. 175-190.

Negi, N. S. and Ganguly, S. (2011) Development Projects vs. Internally Displaced Populations in India: A Literature Based Appraisal. *COMCAD Arbeitspapiere - Working Papers No. 103*. University of Bielefeld, Germany: Centre on Migration, Citizenship and Development.

Ngenyam Bang, H. and Few, R. (2012) Social Risks and Challenges in Post-disaster Resettlement: The Case of Lake Nyos, Cameroon, *Journal of Risk Research*, 15(9): pp. 1141-1157;

Nicholls, R. J., Brown, S. Goodwin, P., et al. (2018) Stabilization of global temperature at 1.5°C and 2.0°C: Implications for coastal areas. *Philosophical Transactions of the Royal Society*, 376(2119).

Nicholls, R. J., Hutton, C. W., Lázár, A. N. et al. (2016) Integrated assessment of social and environmental sustainability dynamics in the Ganges-Brahmaputra-Meghna delta, Bangladesh. *Estuarine, Coastal and Shelf Science*, 183: pp. 370-381.

Nicholls, R. J., Marinova, N., Lowe, J. A., et al. (2011). Sea level rise and its possible impacts given a 'beyond 4°C world' in the twenty-first century. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 369: pp. 161–181

Noll, H. H. (2002) Towards a European system of social indicators: theoretical Framework and system architecture, *Social Indicators Research*, 58: pp. 47–87.

Novotny, P. (2000) *Where We Live, Work and Play: The Environmental Justice Movement and the Struggle for a New Environmentalism*. West Port, CT: Praeger.

Nunn, P.D. (2007) *Climate, Environment and Society in the Pacific During the Last Millennium*. Amsterdam: Elsevier.

O'Brien, K. L. and Leichenko, R. M. (2003) Winners and losers in the context of global change. *Annals of the Association of American Geographers*, 93(1): pp. 89–103.

O'Brien, K., Hayward, B. and Berkes, F. (2009) Rethinking Social Contracts: Building Resilience in a Changing Climate. *Ecology and Society*, 14(2).

O'Neill, O. (2011) Social justice and sustainability: Elastic terms of debate. In: Held, D., Hervey, A. and Theros, M. (eds.) *The governance of climate change: Science, economics, politics and ethics*, Cambridge, UK: Polity. pp. 137–143.

OECD (2011) *How's life? Measuring Well-Being*, Paris: OECD Publishing.

OECD (2013) *OECD guidelines on measuring subjective well-being*. Paris: OECD Publishing.

Offer, A. (2008) 'Should governments try to make people happy?' Presentation at the University of Bath, March 7 2008.

Oliver-Smith, A. (1991) Involuntary resettlement, resistance and political empowerment, *Journal of Refugee Studies*, 4(2): pp. 132–149.

Oliver-Smith, A. (2005) Applied anthropology and development-induced displacement and resettlement, In: Kedia, S. and Willigen, J. (eds) *Applied Anthropology: Domains of Application*. Westport, USA: Praeger Publishers, pp.189-219.

Oliver-Smith, A. (2009) Climate change and population displacement: Disasters and Diasporas in the twenty-first century. In: Crate, S. and Nuttal, M. (eds.),

*Anthropology and Climate Change: From Encounters to Action*. California: Left Coast Press Inc., pp. 116–136.

ONS (2011) *Measuring what Matters: National Statistician's Reflections on the National Debate on Measuring National Well-Being*. London, UK: ONS.

Oppenheimer, C. (2003) Climatic, environmental, and human consequences of the largest known historic eruption: Tambora Volcano (Indonesia) 1815. *Progress in Physical Geography*, 27: pp. 230–259.

Paavola, J. (2003) Protected Areas Governance and Justice: Theory and the European Union's Habitats Directive. *Environmental Science*, 1(1): pp. 59–77

Paavola, J. and Adger, N. (2002) *Justice and adaptation to climate change*. Norwich, UK: Tyndall Centre for Climate Change Research.

Paavola, J. and Adger, W. N. (2006a) Fair adaptation to climate change. *Ecological Economics*, 56(4): pp. 594–609.

Paavola, J. and Adger, W. N. (2006b) *Fairness in adaptation to climate change*. Cambridge, MA: MIT Press.

Page, E. A. and Heyward, C. (2017) Compensating for Climate Change Loss and Damage, *Political Studies*, 65(2): pp. 356-371.

Pascual, U., Phelps, J., Garmendia, E., et al. (2014) Social equity matters in payments for ecosystem services. *Bioscience*, 64: pp. 1027–1036.

Pavot, W. and Diener, E. (1993) Review of the satisfaction with life scale. *Psychological Assessment*, 5(2): 164

Payne, G. and Payne, J. (2011) Community profiles. In: Payne, G. and Payne, J. (eds.) *Key concepts in social research*. London: SAGE Publications

Pecl, G.T., Araújo, M.B., Bell, J.D. et al. (2017) Biodiversity redistribution under climate change: Impacts on ecosystems and human well-being. *Science*, 355(6332): pp. 9214.

Piggott-McKellar, A. E., McNamara, K. E., Nunn, P. D., and Sekinini, S.T. (2019) Moving people in a changing climate: Lessons from two case studies in Fiji. *Social Sciences*, 8: 133.

Piggott-McKellar, A. E., Pearson, J., McNamara, K. E. and Nunn, P. D. (2020) A livelihood analysis of resettlement outcomes: Lessons for climate-induced relocations. *Ambio*, 49: pp. 1474–1489

Piguet, E., Pécoud, A. and De Guchteneire, P. (2011) *Migration and Climate Change*. Cambridge: Cambridge University Press.

Polit, D. F. and Beck, C. T. (2010) Generalization in quantitative and qualitative research: Myths and strategies. *International Journal of Nursing studies*, 47: pp. 1451-1458.

Porter, J. J., Demeritt, D. and Dessai, S. (2015) The right stuff? Informing adaptation to climate change in British Local Government. *Global Environmental Change*, 35: pp. 411-422.

Preston, C.J. (2017) Challenges and opportunities for understanding non-economic Loss and Damage. *Ethics Policy and Environment*, 20: pp. 143–155.

Qing, C., Guo, S., Deng, X. et al. (2021) Farmers' disaster preparedness and quality of life in earthquake-prone areas: The mediating role of risk perception, *International Journal of Disaster Risk Reduction*, 59: 102252.

Rahman, M. M., Ghosh, T., Salehin, M. et al. (2020) Ganges-Brahmaputra-Meghna Delta, Bangladesh and India: A Transnational Mega-Delta. In: Nicholls, R. J., Adger, W. N., Hutton, C. W. and Hanson, S. E. (eds). *Deltas in the Anthropocene*. Netherlands: Palgrave Macmillan

Raleigh, C. and Jordan, L. (2010) Climate change and migration: Emerging patterns in the developing world. In: Mearns, R. and Norton, A. (eds.) *Social dimensions of climate change*, Washington, DC: World Bank, pp. 103–131.



- Raycraft, J. (2020) The (un)making of marine park subjects: Environmentality and everyday resistance in a coastal Tanzanian village. *World Development*, 126: 104696
- Reed, M. S. (2008) Stakeholder participation for environmental management: A literature review. *Biological Conservation*, 141: pp. 2417– 2431.
- Ren, X. (2017) Land acquisition, rural protests, and the local state in China and India. *Environmental and Planning C: Government and Policy*, 35: pp. 25–41.
- Renaud, F. G., Syvitski, J. P. M., Sebesvari, Z. et al (2013) Tipping from the Holocene to the Anthropocene: how threatened are major world deltas? *Current Opinion in Environmental Sustainability*, 5(6): pp. 644–654.
- Renaud, F., Dun, O., Warner, K. and Bogardi, J., (2011) A decision framework for environmentally induced migration. *International Migration*, 49: pp. e5–e29.
- Resh, W., Siddiki, S. and McConnell. W. R. (2014) Does the network centrality of government actors matter? Examining the role of government organizations in aquaculture partnerships. *Review of Policy Research*, 31(6): pp. 584-609.
- Reyes, M. Z. (2004) *Social Research: A Deductive Approach*. Manila: Rex Printing Company
- Richards, J. A. and Bradshaw, S. (2017) *Uprooted by climate change: Responding to the growing risk of displacement*. Oxford, UK: Oxfam.
- Rio Declaration (1992) *Rio Declaration on Environment and Development, The United Nations Conference on Environment and Development*. 3-14 June 1992.
- Roberts, E. and Pelling, M. (2018) Climate change-related loss and damage: translating the global policy agenda for national policy processes. *Climate and Development*, 10: pp. 4–17
- Robeyns, I. (2005) Selecting Capabilities for Quality of Life Measurement, *Social Indicators Research*, 74: pp. 191–215.

Rodgers, S. and Wang, M. (2006) Environmental resettlement and social dis/re-articulation in Inner Mongolia, China. *Population and Environment*, 28: pp. 41–68.

Rollero, C. and De Piccoli, N. (2010) Does place attachment affect social well-being? *European Review of Applied Psychology*, 60: pp. 233–238.

Rowe, G. and Frewer, L. J. (2000) Public participation methods: A framework for evaluation. *Science Technology and Human Values*, 25: pp. 3–29.

Ruano-Chamorro, C., Gurney, G. C. and Cinner, J. E. (2021) Advancing procedural justice in conservation. *Conservation Letters*, pp. 1-12.

Ryan, R. M. and Deci, E. L. (2001) On happiness and Human potentials: A Review of Research on Hedonic and Eudaimonic Wellbeing. *Annual Review of Psychology*, 52: pp. 141-166

Safra de Campos, R., Codjoe, S. N. A., Adger, W. N., et al. (2020) Where people live and move in deltas. In: Nicholls, R. J., Adger, W. N., Hutton, C. W. et al. (eds.) *Deltas in the Anthropocene*, Cham: Palgrave Macmillan, pp. 153-177.

Saglie, I. S., Inderberg, T. K. and Rognstad, H. (2020) What shapes municipalities' perceptions of fairness in windpower developments? *Local Environment*, 25 (2): pp. 147 – 161.

Samling, C.L., Ghosh, A.K. and Hazra, S. (2015) Resettlement and Rehabilitation: Indian Scenario. *DECCMA Working Paper: Deltas, Vulnerability and Climate Change: Migration and Adaptation*

Sati, V.P. and Vangchhia, L. (2017) *A Sustainable Livelihood Approach to Poverty Reduction: An Empirical Analysis of Mizoram, the Eastern Extension of the Himalaya*. Cham: Springer.

Satiroglu, I. and Choi, N. (2015). *Development-induced displacement and resettlement: New perspectives on persisting problems*. Oxford: Routledge.

Saunders F, Gilek M, Ikauniece A. et al. (2020) Theorizing Social Sustainability and Justice in Marine Spatial Planning: Democracy, Diversity, and Equity. *Sustainability*. 12: 2560

Sayer, A. (2011) *Why Things Matter to People: Social Science, Values and Ethical Life*. Cambridge: Cambridge University Press.

Schlosberg, D. (2007) *Defining environmental justice: Theories, movements, and nature*. Oxford: Oxford University Press.

Schlosberg, D. (2012) Climate justice and capabilities: a framework for adaptation policy. *Ethics and International Affairs*, 26: pp.445–461

Schlosberg, D. (2013) Theorizing Environmental Justice: The Expanding Sphere of a Discourse. *Environmental Politics*, 22(1): pp. 37–55.

Schlosberg, D. and Collins, L. B. (2014) From environmental to climate justice: climate change and the discourse of environmental justice. *WIREs Climate Change*, 5: pp. 359–574.

Schlosberg, D., Collins, L. B. and Niemeyer, S. (2017) Adaptation policy and community discourse: risk, vulnerability, and just transformation. *Environmental Politics*, 26(3): pp. 413-437.

Schmidt-Soltau, K. and Brockington, D. (2007). Protected areas and resettlement: What scope for voluntary relocation? *World Development*, 35: pp. 2182–2202.

Schoonenboom, J. and Johnson, R. B. (2017) How to Construct a Mixed Methods Research Design, *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie*, 69: pp. 107–131.

Schreckenberg, K., Franks, P., Martin, A. and Lang, B. (2016) Unpacking equity for protected area conservation. *Parks*, 22: pp. 11–28.

Schwartz, B. (2004) *The paradox of choice: Why more is less*. New York: Ecco.

- Scott, J. T., Matland, R. E., Michelbach, P. A. and Bornstein, B. H. (2001) Just Deserts: An Experimental Study of Distributive Justice Norms. *American Journal of Political Science*, 45(4): pp. 749–767.
- Sen, A. (1985) Well-being, agency and freedom: The Dewey lectures 1984, *Journal of Philosophy*, 82(4): pp. 169–221.
- Sen, A. (2009) *The Idea of Justice*. Cambridge, MA: Belknap.
- Sharma, G. (2017) Pros and cons of different sampling techniques. *International Journal of Applied Research*, 3(7): pp. 749-752
- Sheller, M and Urry, J. (2006) The New Mobilities Paradigm, *Environment and Planning A*, 38(2): pp. 207-226.
- Siddiki, S. and Goel, S. (2017) Assessing collaborative policymaking outcomes: an analysis of U.S. Marine Aquaculture Partnerships. *American Review of Public Administration*, 47(2): pp. 253-271.
- Siders, A. R. (2019) Social justice implications of US managed retreat buyout programs. *Climatic change*, 152(2): pp .239-257.
- Siders, A. R., Ajibade, I. and Casagrande, D. (2021) Transformative potential of managed retreat as climate adaptation. *Current Opinion in Environmental Sustainability*, 50: pp. 272-280.
- Sikor, T. (2013) *The Justices and Injustices of Ecosystem Services*. London and New York: Routledge.
- Sikor, T., Martin, A., Fisher, J., and He, J. (2014). Toward an empirical analysis of justice in ecosystem governance. *Conservation Letters*, 7: pp. 524–532
- Silva, J. A. and Mosimane, A. W. (2012) Conservation-Based Rural Development in Namibia: A mixed-methods assessment of economic benefits, *Journal of Environment and Development*, 22(1): pp. 25-50.

Sipe, N. and Vella, K. (2014) Relocating a Flood-Affected Community: Good Planning or Good Politics?, *Journal of the American Planning Association*, 80(4): pp. 400-412

Sisinggih, D., Wahyuni, S. and Juwono, P. (2013) The resettlement programme of the Wonorejo Dam Project in Tulungagung, Indonesia: The perceptions of former residents. *International Journal of Water Resources Development*, 29: pp. 14–24.

Sloane, P. (1991) Experiences and expectations of government services: the older Soviet immigrant. *Journal of Cross-Cultural Gerontology*, 6(2): pp. 193–197.

Smith, P. and McDonough, M. (2001) Beyond public participation: fairness in natural resource decision making. *Society and Natural Resources*, 14(3): pp. 239–249.

South 24 Parganas District (2015) District Disaster Management Plan, South 24 Parganas 2015. Office of the District Magistrate, South 24 Parganas District, Government of West Bengal. Website Accessed September 2018 <[http://s24pgs.gov.in/pdf/depart\\_up/DM%20Plan-2015.pdf](http://s24pgs.gov.in/pdf/depart_up/DM%20Plan-2015.pdf)>

Speller, G. (2000) *A Community in Transition: A Longitudinal Study of Place Attachment and Identity Processes in the Context of an Enforced Relocation*. Theses from the University of Surrey.

Stanley, J. (2004) Development-induced displacement and resettlement. *Forced Migration Online*.

Stefancu, O. (2022) Voices of Ghoramara Island, India. The case for planned relocation. In: Ajibade, I. J. and Siders, A. R. *Global views on climate relocation and social justice*. New York: Routledge, pp. 152-162.

Stiglitz, J., Sen, A. and Fitoussi, J. P. (2009) Report by the Commission on the Measurement of Economic Performance and Social Progress.

Stojanov, R., Kelman, I., Martin, M., et al. (2014) *Migration as Adaptation? Population Dynamics in an Age of Climate Variability*. Global Change Research Centre, The Academy of Sciences of the Czech Republic, Brno.

Sun, F and Xiao J. J. (2012) Perceived Social Policy Fairness and Subjective Wellbeing: Evidence from China. *Social Indicators Research*, 107: pp. 171 – 186.

Syme, G. and Nancarrow, B.E. (2012) *Justice and the allocation of natural resources: Current concepts and future directions*. New York, USA: Oxford University Press.

Syme, G., Nancarrow, B. E. and MaCredidin, J. A. (1999) Defining the components of fairness in the allocation of water to environmental and human uses. *Journal of Environmental Management*, 57: pp. 51– 70.

Syme, G.J., Kals, E., Nancarrow, B.E. and Montada, L. (2000) Ecological risks and community perceptions of fairness and justice: a cross-cultural model. *Risk Analysis*, 20(6): pp .905-916.

Tacoli, C. (2009) Crisis or adaptation? Migration and climate change in a context of high mobility. *Environment and Urbanization*, 21: pp. 513–525.

Tacoli, C. (2011) Migration and mobility in a changing climate: a policy perspective. *Revista Interdisciplinar da Mobilidade Humana*, 19 (36): pp. 113–124.

Taylor, D. E. (2000) The rise of the environmental justice paradigm: injustice framing and the social construction of environmental discourses. *American Behavioural Scientist*, 43: 508.

Terminski, B. (2013) *Development-induced displacement and resettlement: Theoretical frameworks and current challenges*, Geneva, Switzerland: University of Geneva.

Terminski, B. (2015) *Development-induced displacement and resettlement: Causes, consequences, and socio-legal context*. Stuttgart, Germany: Columbia University Press.

Tessler, Z. D., Vörösmarty, C. J., Grossberg, M. et al. (2015) Profiling risk and sustainability in coastal deltas of the world. *Science*, 349(6248): pp. 638–643.

Thibaut, J. and Walker, I. (1975) *Procedural Justice: A Psychological Analysis*. Hillsdale, NJ: Erlbaum

Thomas, D. S. G. and Twyman, C. (2005) Equity and justice in climate change adaptation amongst natural-resource dependent societies. *Global Environmental Change*, 15: pp. 115–124

Tilt, B., Braun, Y. and Daming, H. (2009) Social impacts of large dam projects: A comparison of international case studies and implications for best practice, *Journal of Environmental Management*, 90(3): pp. S249-S257

Tong, W., Zhang, W., Lo, K. et al. (2017) Age differentiated impact of land appropriation and resettlement on landless farmers: A case study of Xinghua Village, China. *Geographical Research*, 55: pp. 293–304.

Tschakert, P., Barnett, J., Ellis, N., et. al. (2017) Climate change and loss, as if people mattered: values, places, and experiences. *Wiley Interdisciplinary Reviews Climate Change*, 8(5)

Tschakert, P., Ellis, N. R., Anderson, C. et al. (2019) One thousand ways to experience loss: A systematic analysis of climate-related intangible harm from around the world, *Global Environmental Change*, 55: pp. 58-72.

Turney, C. S. M. and Brown, H. (2007) Catastrophic early Holocene sea level rise, human migration and the Neolithic transition in Europe. *Quaternary Science Reviews* 26: pp. 2036–2041.

Tyler, T. R. (2006) Restorative Justice and Procedural Justice: Dealing with Rule Breaking, *Journal of Social Issues*, 62(2): pp. 307-326

Tyler, T. R. (2015) Social justice. In M. Mikulincer, P. R. Shaver, J. F. Dovidio, and J. A. Simpson (eds.), *APA handbook of personality and social psychology*; Vol. 2 American Psychological Association. (pp. 95–122).

Tyler, T. R. and Blader, S. L. (2003) The group engagement model: Procedural justice, social identity, and cooperative behaviour. *Personality and Social Psychology Review*, 7, pp. 349–370.

UNFCCC (2010) *The Cancún Agreements: Outcome of the Work of the Ad Hoc Working Group on Long-Term Cooperative Action under the Convention*. In: 9th Plenary Meeting 10<sup>th</sup> – 11<sup>th</sup> December 2010.

UNFCCC (2015) *Adoption of the Paris agreement*, Conference of the parties, November 30–December 11.

UNHCR (2015) Guidance on Protecting People from Disasters and Environmental Change through Planned Relocation. Website accessed March 2019

<<http://www.unhcr.org/protection/environment/562f798d9/plannedrelocation-guidance-october-2015.html>>

UNHCR (United Nations High Commissioner for Refugees), Georgetown University and the Brookings Institution (2015) *Guidance on protecting people from disasters and environmental change through planned relocation*. Geneva: UNHCR.

Vaismoradi, M. (2013) Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing and Health Sciences*, 15: pp. 398–405.

Vanclay, F. (2017) Project-induced displacement and resettlement: from impoverishment risks to an opportunity for development?, *Impact Assessment and Project Appraisal*, 35(1): pp. 3-21.

Vanderheiden, S. (2011) Globalizing Responsibility for Climate Change, *Ethics and International Affairs*, 25(1): pp. 65-84.



Veenhoven, R. (1995) The cross-national pattern of happiness: test of predictions implied in three theories of happiness, *Social Indicators Research*, 34: pp. 33–68.

Veenhoven, R. (2000) Freedom and happiness: A comparative study in forty four nations in the early 1990s. In: Diener, E. and Suh, E. M. (eds) *Culture and Subjective Well-being*. Cambridge, MA, US: The MIT Press. pp. 185-218.

Veenhoven, R. (2002) Why social policy needs subjective indicators, *Social Indicators Research*, 58: pp. 33–45.

Velasquez, M., Andre, C., Shanks, S.J. and Meyer, M. J. (2014) *Justice and Fairness*. Markkula Centre for Applied Ethics at Santa Clara University

Vulturius, G. and Davis, M. (2016) Defining loss and damage: The science and politics around one of the most contented issues with the UNFCCC, *Stockholm Environment Institute*, Discussion brief.

Walker, G. (2011) *Environmental justice: Concepts, evidence and politics*. London and New York: Routledge.

Walker, G. (2012) *Environmental Justice: Concepts, Evidence and Politics*. Routledge, New York.

Walker, G. (2014) Environmental Justice: Empirical Concerns and Normative Reasoning. *Analyse and Kritik*, 36(2): pp. 4–5.

Walker, G. and Burningham, K. (2011) Flood risk, vulnerability and environmental justice: Evidence and evaluation of inequality in a UK context. *Critical Social Policy*, 31(2): pp. 216–40.

Wang, Y. and Wall, G. (2007) Administrative arrangements and displacement compensation in top-down tourism planning—A case from Hainan Province, China. *Tourism Management*, 27: pp. 70–82.

Warner, K. (2010) Global environmental change and migration: Governance challenges, *Global Environmental Change*, 20(3): pp. 402–413.

Warner, K., Afifi, T., Kalin, W. et al (2013) *Changing Climate, Moving People. Framing Migration, Displacement and Planned Relocation* (UNU-EHS Policy Brief no. 8). Bonn.

Warner, K., Hamza, M., Oliver-Smith, A. et al. (2010) Climate change, environmental degradation and migration. *Natural Hazards*, 55(3): pp. 689–715.

Warner, K., van der Geest, K., Kreft, S. et al. (2012). *Evidence from the frontlines of climate change: Loss and damage to communities despite coping and adaptation Loss and Damage in Vulnerable Countries Initiative* (Policy report. Report no. 9). Bonn: United Nations University Institute for Environment and Human Security (UNU-EHS).

Watson, D., Clark, L. A. and Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of personality and social psychology*, 54(6): pp.1063–70.

Wayessa, G. O. (2010) Procedural Justice and Livelihood-Outcomes Justice: A Framework for Analyzing Attitudes of Resettlers and Hosts towards Resettlement, *International Journal of Interdisciplinary Social Science*, 5: pp. 477-492

Weerasinghe, S. (2014) *Planned relocation, disasters and climate change: Consolidating good practices and preparing for the future*. Sanremo: UNHCR (The UN Refugee Agency).

West Bengal Disaster Management and Civil Defence Department (2020) District Disaster Management Plan 2020-21 South 24 Parganas. Government of West Bengal. Website accessed September 2021  
<<http://wbdmd.gov.in/writereaddata/uploaded/DP/DPSouth%2024-Parganas81787.pdf>.>

WGHR (Working Group on Human Rights) (2012) *Human Rights in India: Status Report*. New Delhi: Working Group on Human Rights in India and the UN.

White, S. C. (2010) Analysing wellbeing: a framework for development practice. *Development in Practice*, 20: pp. 158–172.

White, S. C. (2017) Relational wellbeing: re-centring the politics of happiness, policy and the self. *Politics Policy*, 45(2): pp. 121–136

White, S. C. and McGregor, J. A. (2006) *The Cultural Construction of Wellbeing: Seeking Healing in Bangladesh*. WeD Working Paper 15, ESRC Research Group on Wellbeing in Developing Countries, Bath.

Wilmsen, B. and Wang, D. (2014) Voluntary and involuntary resettlement in China: A false dichotomy. *Development in Practice*, 25: pp. 612–627.

Winter, S. C. and May, P. J. (2001) Motivation for compliance with environmental regulations. *Journal of Policy Analysis and Management*, 20(4): pp. 675-698.

Wood, A. W. (2014) Coercion, manipulation, exploitation. In: Conns, C. and Weber, M. (eds.) *Manipulation* New York: Oxford University Press. pp. 17–50.

Woodhouse, E. and McCabe, J. T. (2018) Well-being and conservation: diversity and change in visions of a good life among the Maasai of northern Tanzania. *Ecology and Society*, 23(1): pp. 43.

Woodhouse, E., Homewood, K. M., Beauchamp, E. et al., (2015) Guiding principles for evaluating the impacts of conservation interventions on human well-being, *Philosophical Transactions of the Royal Society B*, 370: 20150103

Yarnell, M. (2014) *When Push Comes to Shove: Displaced Somalis Under Threat*. Washington DC: Refugees International

Zafra-Calvo N., Garmendia E., Pascual U. et al. (2019) Progress toward Equitably Managed Protected Areas in Aichi Target 11: A Global Survey. *BioScience*. 69: pp. 191–197.