

University of Southampton, 2018

FACULTY OF SOCIAL AND HUMAN SCIENCES

SCHOOL OF GEOGRAPHY AND THE ENVIROMENT

The role of livelihood activities and income portfolios in shaping women's perceptions of wellbeing and adaptation choices, in the Indian Bengal Delta

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A dissertation submitted in partial

fulfilment of the degree of MSc Sustainability

by taught course



Statement of Originality

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A handwritten signature in black ink, appearing to read 'R. Mimi' or 'Rosalyn Mimi', written in a cursive style.

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Acknowledgements

Firstly, I would like to acknowledge my friends and family who have supported me endlessly. I am thankful to my study partner, Lindsay Roberts for the academic and personal support she has given me. I would also like to acknowledge my supervisor, Emma Tompkins who has been a huge part of the development of this study and gave me the opportunity to travel to West Bengal, India. I would like to thank the staff and students at Jadavpur University, Kolkata. They welcomed me and my colleagues to India and were very helpful throughout the field work. I would especially like to thank Sumana Banjeree and Tuhin Ghosh at Jadavpur University for their assistance. Also Sanyantika, a Masters student at Jadavpur University who worked with me to conduct the interviews in Dulki, West Bengal. Thank you to Katherine Vincent for her extensive knowledge on gender issues throughout the field work. I would also like to thank Craig Hutton, who supported my interest in gender studies early on in my Master's degree.

This research was undertaken as part of the project 'Climate Adaptation & Services Community (CASCO), contract no ICI+/2014/342-806 funded by the European Union, Delegation to India. It draws on work carried out under the Deltas, vulnerability and Climate Change: Migration and Adaptation (DECCMA) project (IDRC 107642) under the Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA) programme.

Abstract

It has been documented in research that an important element in researching the impacts of social, economic and environmental change on rural communities and their livelihoods is gender. Rural areas of India face their own set of challenges ranging from environmental challenges, changes in social structure to household economic security. Agricultural employment in India is well researched due to India's economic reliance on the agricultural sector. The roles of non-agricultural work of rural women is widely studied. Women's employment has been documented to empower rural women in a society that has historically constrain women due to traditional and conservative attitudes of gender roles. It is not understood how women's livelihoods impact their wellbeing and adaptive capacity and what factors interplay with these components. The study was conducted to determine the role of livelihood activities and income portfolios in shaping women's perception of wellbeing and adaptation choices. A mixed method approach will be used in this study of household survey and interview data. The data will be used to determine the typical livelihood activities and income portfolios of women in the Indian Bengal Delta. It will also be examined if livelihood activities or income portfolios affect how women cope with environmental and social influences. Also it will be considered how a woman's livelihood activities and income portfolio impacts their wellbeing. The findings of this paper will improve the understanding of the gender roles and responsibilities of rural women in a context of livelihood choices, adaptive capacity and wellbeing.

Contents

Contents

Statement of Originality.....	2
Acknowledgements.....	3
Abstract.....	4
Contents.....	5
List of Figures	7
List of Tables	7
Abbreviations.....	7
Chapter 1: Introduction	8
1.1 Research setting.....	8
1.2 Aim and Objectives	9
Chapter 2: Literature review.....	10
2.1 Why focus on rural communities.....	10
2.2 Why focus on women	10
2.3 Why explore women's work opportunities	11
2.4 Typical livelihood activities and income portfolios of rural women.....	13
2.5 Rural Women's livelihood activities and income portfolio's. How they relate to environmental and social influences	15
2.6 How does a rural woman's livelihood activities and income portfolio impact her wellbeing?	20
Chapter 3: Methodology.....	21
3.1 Introduction	21
3.2 Study Area.....	22
3.3 Data.....	23
3.4 Ethics.....	25
Chapter 4: Results.....	26
4.1 Introduction	26
4.2 Quantitative Results.....	27
4.3 Gaps found in the DECCMA household survey (Links Quantitative and Qualitative).....	31
4.4 Qualitative Results	33
Chapter 5: Discussion.....	49
5.1 Typical livelihood activities and income portfolios of women in the IBD.....	49
5.2 How a woman's livelihood activities or income portfolio affects how they cope with monsoon season environmental and social influences	50

5.3 How a woman's livelihood activities and income portfolio impacts her wellbeing	51
5.4 Positionality.....	52
5.5 Limitations.....	52
Chapter 6: Conclusion	53
6.1 Recommendations	54
References	55
Appendices.....	61
Appendix 1: Participant Consent	61
Appendix 2: Participant Debrief Form	62
Appendix 3: Participant Information Sheet	63
Appendix 4: Interview Schedule	65
Appendix 5: Frequency Tables from DECCMA household survey.....	67
Appendix 6: Secondary data ethics form	78
Appendix 7: SSEGM Ethics form.....	82
Appendix 8: ERGO risk assessment form	87

Word count – 17,305

List of Figures

Figure 1 Definition of a livelihood diagram..	14
Figure 2 Map of the Indian Bengal Delta	22
Figure 3 Pie chart showing which member of the household goes without food first	27
Figure 4 Graphs showing decision making power of adult males and females in the IBD	27
Figure 5 Graphs showing happiness and life satisfaction of women in the IBD	28
Figure 6 Pie charts showing levels of agreement with statements regarding personality traits of women in the IBD	30
Figure 7 Pie chart showing levels of agreement with friends and family support of women in the IBD	31
Figure 8 Factors of individual wellbeing diagram	33

List of Tables

Table 1 A table showing the livelihood activities of interview participants	34
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Abbreviations

DECCMA - Deltas, vulnerability & Climate Change: Migration & Adaptation

GDP - Gross Domestic Product

IBD – Indian Bengal Delta

SDGs - Sustainable Development Goals

UNESCO - The United Nations Educational, Scientific and Cultural Organisation

1.1 Research setting

1.1.1 Why India

India's vast economic growth in the last 30 years has encouraged a global interest in understanding its complex society (Desai *et al.*, 2010). There is increasing evidence that climate change is a phenomenon behind the transformations in development, social change and governmental policy internationally (Pham *et al.*, 2016) (Millner and Dietz, 2015). Developing countries such as India face tremendous environmental, social and economic pressures and are more vulnerable to the adverse affects of climate change than developed countries (Millner & Dietz, 2015).

Developing countries are often located in 'geographically sensitive' areas, meaning that their geographic location make them more susceptible to impacts from weather hazards. These countries experience especially low or high average rainfall and annual and seasonal variability of weather, for example the monsoon season in India (Pottapinjara et al., 2014). The sensitivity of the economy in developing countries like India, can be characterised by the reliance on sectors that are impacted by weather variability, such as agriculture (Sultana, 2014). In developing countries such as India and Nepal agriculture generates more than half of the national GDPs (Gross Domestic Product) (Singaariya & Sinha, 2015) (Chalise & Naranpanawa, 2016).

Due to India's geographic location and its economic reliance on the agricultural sector, the country is increasingly sensitive to climate change (Sultana, 2014). Rainfall in India is historically variable, as the rainfall is characterised by multiple atmospheric and oceanic systems (Nair *et al.*, 2018). According to the IPCC there will be changes in rainfall patterns and a warmer climate in South Asia (Field, 2014). Countries such as India may experience increases in rainfall and extreme monsoon seasons. This leads to more frequent, immense and persistent floods. Also, the IPCC predicts a warmer climate leading to increased dry seasons outside of the monsoon season (Field, 2014). Climate change modelling studies in India have established that the country is likely to experience a warming of over 3–5°C by the year 2030 (Ravindranath *et al.* 2011).

The IPCC reported that the combination of more intense cyclones and a rise in sea level would increase coastal flooding in India (Knutson et al., 2010) and wave damage would cause loss of mangrove forest area (Villanoy et al., 2012).

1.1.2 Why the Indian Bengal Delta

The Sundarban region of the Indian Bengal Delta (IBD) was selected as the study area. The IBD is subject to multiple environmental and social stresses related to changes in weather variability (Ahmad & Khatun, 2018) (Banerjee, 2018). The intertidal, low lying mangrove forests of the Indian Sundarban region are now under serious stress due to sea level rise (Banerjee, 2018). The Sundarban region is characterised by its mangrove forests, which are one of the most important primary resources of deltaic regions globally (Pramanik, 2014). As a mangrove dominated area, the India Sundarbans is known for its rich biodiversity. In 1987 the Sundarbans were inscribed a 'World Heritage Site' by UNESCO and the Indian government permitted the Sundarbans as a 'Biosphere Reserve', to protect the unique environment from degradation (Mitra et al., 2009).

Mangrove forests act as natural dykes during coastal storms (Jusoff, 2006) and also maintain water quality in deltaic regions (Lugo & Snedaker 1974). The degradation of mangrove forests put local populations at risk. The Indian Sundarbans consists of 106 deltaic islands where 54 of 106 islands are inhabited by human populations (Pramanik, 2014). The Sundarban region is made up of rural settlements that rely on their interactions with the surrounding environment, which generates a large part of their economic productivity (Ahmad & Khatun, 2018).

India is a large diverse population. When taking this into account its cultural richness and religious diversity makes it a central focus for research into economic growth, environmental challenges and development (Desai *et al.*, 2010). To gain further understanding on the lives of Indian communities, such as rural communities, divisions such as gender, caste, and religion must be considered when focusing on human development in India (Pham *et al.*, 2016).

Research on rural women's lives in developing countries has flourished in recent years, yet rural policy integrates only certain issues identified (Sachs, 2018). It has been documented in research that an important element in researching the impacts of social, economic and environmental change on rural communities and their livelihoods is gender (Villamor et al. 2014). Both social and environmental pressures have impacts on India's economy. Although these pressures lead to certain hardships in rural communities that are mostly reliant on the agricultural sector, there is also space for the development of new social norms and non- agricultural small-scale innovations.

1.2 Aim and Objectives

Aim: To explore the role of livelihood activities and income portfolios in shaping women's perception of wellbeing and adaptation choices.

Objectives:

1. To document the typical livelihood activities and income portfolios of women in the IBD
2. Does a woman's livelihood activities or income portfolio affect how they cope with environmental and social influences
3. How does a woman's livelihood activities and income portfolio impact her wellbeing?

Chapter 2: Literature review

This chapter will evaluate the current literature relating to the above aim and objectives. It will be justified why this study is using a gendered approach and key concepts will be explained.

2.1 Why focus on rural communities

It must be considered what shapes rural communities; their livelihoods, their education, their health, and their social connections. This will gain an understanding on the challenges rural communities face and where the current social and environmental pressures lie.

Rural areas of India face their own set of challenges ranging from environmental challenges, changes in social structure to household economic security. Rural communities of India often struggle with alleviating poverty (Chambers, 2014). Further, communities in poverty are the most vulnerable to the impacts of climate change. This is because they are often located in 'hotspot' areas and also have low adaptive capacity to cope with weather hazards (Chanana & Aggarwal, 2018) (Ravindranath *et al.* 2011).

There is much less opportunity for employment in rural India than in urban areas (Glass Jr & O'Brien, 2016). However, in India, as in most developing economies, households derive income from a wider range of sources (Imai *et al.*, 2015). Rural areas of India rely mainly on the agricultural sector for income (Arjun, 2013). Due to the gradual decline in the productivity of the agricultural sector in India over the past 30 years (Siddiqui, 2015), rural areas are diversifying their income activities (Pavithra & Vatta, 2013). It is now being recognised that the rural economy in India is not purely generated through agricultural practice and rural households have a tendency to diversify their income, assets and activities to enhance income and reduce risk (Imai *et al.*, 2015).

2.2 Why focus on women

In developing countries particularly in India, gender is an important factor when considering possible discriminations against members of a population (Waris *et al.*, 2016). Women of India face social exclusion throughout different stages of their lives (Das & Tarai, 2011). In a patriarchal society,

women are recognised as being of a lower status than that of men, and poverty is higher among women than men in these societies (Sheheli, 2012).

Women in India face social constraints due to traditional and conservative attitudes, particularly in rural areas (Gius & Subramanian, 2015). The work of women in India is mostly confined to the household due to cultural, religious and social restrictions (Koehler-Rollefson, 2018). Kabeer (2016) stated that 'Gender-ascribed constraints are rooted in the customary norms, beliefs, and values that characterise the "intrinsically gendered" relationships of family and kinship.'

Rufat *et al.*, 2016 reported that factors such as gender and income (livelihoods) are important in an individual's capacity to prepare for, respond to, and recover from weather hazards, such as heavy rain and floods. Men and women experience and react to impacts of climate change differently in developing countries (Denton, 2002). Gender roles in the Indian society differ greatly between men and women and this impacts their differential resource access, opportunities, power, rights, employment, and income (UNDP, 2011) (Rufat *et al.*, 2016).

Women carry out the majority of work in agriculture at the global level. However according to Sachs, (2018), men own the land, control decisions regarding working outside the household, and decisions concerning agricultural practice in the society of India. There is an increasing awareness of the need to document the perceptions of both women and men in rural areas (Bhattarai *et al.*, 2015). There is an under-representation of rural women in literature considering the number of women that make up the agricultural work force. Another area that is not well documented is the enterprises and assets that make up a rural woman's livelihood.

When reading papers relating to women in India a reoccurring issue in papers were identified. A variety of articles denoted women as weak and not resourceful with no empirical evidence and use of fairly emotional terminology that should not be use in journal articles. These publications are not useful to gender studies as the challenges women face are not fairly described and the influence these challenges have on women's lives is depicted in a way that doesn't give acknowledgement to the resourcefulness of Indian women and their economic advancement.

2.3 Why explore women's work opportunities

Rural economies in India are shaped by both social and environmental pressures (Glass Jr & O'Brien, 2016). It has been recognised that pressure on a household due to environmental stress can shape new social 'norms' around the opinion people have on working women (Maertens, 2017). It has been documented that communities come together during challenging economic or environmental periods and work together regardless of their own agenda or status. This can be referred to as

‘collective action’ and is defined by Story *et al.*, (2018) as ‘putting aside one's own self-interest and acting on behalf of the community’. This type of social cohesion brings opportunity for women to be accepted into an agricultural work force or to make economic venture of their own.

Kabeer (2016) found evidence that gender equality and opportunities for women to work contributed to economic growth across a range of different countries and time periods. Shettar & Rajeshwari (2015) recognised that access to education, employment and a change in social structure are the most important factors in working towards improving the lives of rural women. Entrepreneurship and creation of small businesses can play an important role in rural development (Saxena, S., 2012).

Many studies have argued that because women have less access to employment in developing countries, they are most vulnerable to climate change impacts (Dankelman, 2010)(Skinner, 2011). This could form a feedback loop where women who don't have access to employment opportunities are challenged to cope with influences such as social and environmental risks. Women's empowerment, through employment, in rural areas has been acknowledged to improve infant health as women are often responsible for decisions regarding their children (Cunningham *et al.*, 2015). In an empirical analysis by Doepke & Tertilt (2011) it stated that ‘money in the hands of mothers benefits children’. As well as child health, women who work are found to have increased access to resources and decision making power regarding such resources (Shettar & Rajeshwari, 2015).

However, an increased opportunity for rural women to engage in work means that there might be negative impacts that come with added responsibility. In the process of starting a small business, women have to face various problems associated with entrepreneurship and these problems are enhanced because of existing responsibilities within the household (Jaiswal *et al.*, 2013). This can impact their wellbeing as pressure to maintain a steady household interfere with the desire to create a business and seek greater opportunity.

In this study it is important that the reader understands the definitions and concepts that will be used in forming ideas. The following part of this chapter will approach key words and concepts and ideas categorised into the three research objectives previously stated.

2.4 Typical livelihood activities and income portfolios of rural women

2.4.1 Livelihood

The term livelihood was described by Chambers (1989, p. 7) as “adequate stocks and flows of cash to meet basic needs”. This definition does not acknowledge the activities carried out that generate these ‘stock and flows’.

Wallman (1984) stated ‘livelihood is never just a matter of finding or making shelter, transacting money, getting food to put on the family table or to exchange in the marketplace. It is equally a matter of ownership and circulation of information, the management of skills and relationships and the affirmation of personal significance and group identity. The tasks of meeting obligations, of security, identity and status, and organising time are as crucial to livelihood as bread and shelter’.

Niehof (2004) recognised that a livelihood is a multi-faceted concept. Livelihoods must be considered as being both the activities people carry out and what is generated by carrying out these activities. Niehof (2004) used the systematic definition of a livelihood by Niehof and Price (2001) in developing conceptualised components that form a livelihood;

- **Inputs:** resources and assets.
- **Output:** livelihood.
- **Purpose:** livelihood adequacy for meeting basic needs.
- **Activities:** livelihood generation and the composition of the livelihood portfolio.
- **Agency:** efforts of households and individuals to achieve livelihood adequacy.
- **Quality:** degree of vulnerability (or sustainability) of the livelihood produced.
- **Environment:** context within which the livelihood system functions interfaces with other systems and institutions.
- **Locus:** the household as the locus of livelihood generation

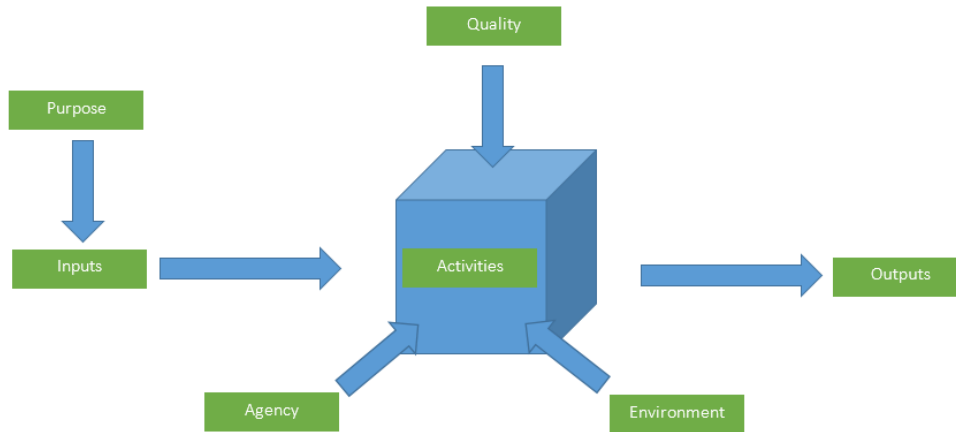


Figure 1- Definition of a livelihood diagram. Developed from Niehof and Price (2001) systematic definition of a livelihood.

Niehof's component approach was selected to define a livelihood in this study as it captures the holistic nature of a livelihood, see Figure 1. This was also recognised by Bebbington (1999) who acknowledged the human, natural, social and cultural assets that formulate a livelihood as well as the importance of gender relations. Bebbington (1999) recognised that assets are not just resources, they are also the ability of an individual to act and to follow or challenge the systems in place that manage use of resources.

There are few definitions in research of what an 'income portfolio' is and the context in which this term is utilised. In this paper an income portfolio is the trade and flow of assets that generate an income, monetarily or in another form such as food or resources. In this paper an income is considered as an outcome from a livelihood activity. Therefore an income portfolio is an assemblage of all outcomes from one or more livelihoods.

2.4.2 India's agro-based economy

As mentioned in Chapter 1, agriculture plays a vital role in India's economy, providing employment to over 60% of the population (Srivastava *et al.*, 2016). Arjun (2013) reported that more than 70% of rural households in India depend on agriculture. Agricultural challenges in India are therefore well documented in literature, with 924 papers being published in the year of 2017 (Scopus search engine results). With papers investigating factors such as population growth, reduction in cultivated land, loss in soil fertility, decrease in biodiversity and how these issues influence farming households. Agriculture plays a critical role in developing countries in the reduction of poverty, increase in food security, improvement in income disparities and also supplying ecosystem services (Byerlee *et al.*, 2009).

In recent years there has been more research into non-farming incomes. With the aforementioned pressures on the agricultural sector in India there are opportunities for non-farming initiatives and ventures in rural areas. The diversification of the rural economy towards non-farm activities has considerable potential to enhance rural households' income. (de Janvry et al., 2005). In a study by Chand et al. (2011) it was reported that if agriculture were the sole source of income in rural communities, the majority of these communities would remain poor. This encourages the research area of non-farming incomes in rural areas, since the rural Indian economy is shifting from solely agriculturally based to a more diverse set of practices.

In rural areas of India, there is a lack of employment opportunities for women (Lei *et al.*, 2017). Past research studies have acknowledged how demographic characteristics, education and Indian culture suppress the opportunities available women of India opportunity to work (Lei *et al.*, 2017). Discrepancies exist between men and women in India in all public sectors (Sheheli, 2012). Furthermore, most of the agricultural work carried out by women is within a family owned smallholding (Desai et al. 2010), and does not result in an income that is independent of male members of the household. Non-agricultural incomes have been reported to give women more control over their decisions than just working in the field.

There is an absence of literature regarding women's non-agricultural livelihoods in rural India, as women move beyond the household to secure their family's incomes in times of hardship (Singh *et al.*, 2018). For example tailoring, tutoring, livestock management, small businesses and other assets. However, studies focusing on the diversification of rural livelihoods show that non-agricultural livelihoods increases women's power over child wellbeing, household decision making and control over household resources (Lei *et al.*, 2017).

2.5 Rural Women's livelihood activities and income portfolio's. How they relate to environmental and social influences

2.5.1 Vulnerability

In research it is important to consider vulnerability, as often populations are considered as a whole, lacking acknowledgement of marginalised groups. Women in India are often considered vulnerable in literature due to their lower status than men in most communities and lack of decision making power in many aspects of their lives (Paxton & Hughes, 2015).

Pham *et al.* (2016) found that impacts of climate change cannot be considered in isolation and need to be put in the context of other important changes that are taking place, such as vulnerability. There is growing evidence in climate based research that both perceptions of risk and its impact on

individuals are related to the individual's social position such as gender (Sultana, 2014). In the IPCC's Third Assessment Report, McCarthy *et al* (2001) define vulnerability as "the degree to which an environmental or social system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes". Miller *et al.* 2010 highlighted that it is important to note that 'vulnerability is not static, but rather is constantly changing'.

O'Brien *et al.*, (2007) refers to vulnerability as a complex variable and stated that "contextual vulnerability is based on a processual and multidimensional view of climate-society interactions". According to Yadav & Lal (2018) the extent of vulnerability of an individual or group within a population depends on rights, roles and responsibilities. Women are one of the most vulnerable groups in India and most developing countries (Ramesh & Bhavani, 2018). Women in India face great social challenges due to the patriarchal society that leads to underrepresentation, lesser opportunities, sometimes social exclusion and lack of decision making power (Lei *et al.*, 2017). India has been reported as the 'most dangerous country for women' in its current social climate, in a poll conducted by the Thomson Reuters Foundations this year. This poll involved experts on women issues in reference to aid, development, health work, policy, NGOs, and media. It has also been found that women in India are less likely to work than any country in G20, except for Saudi Arabia (The Economist, 2018).

2.5.2 Eco feminism and Sustainable Development

The concern of gender issues has been a key focus in the path to international sustainability from the outset of the UN Millennium development goals (Agenda 21, Chapter 24; United Nation Division Sustainable Development [UN], 1992). During the Rio summit 2012 the UN's fundamental goal of 'the creation of an environmentally and socially sustainable global economy and way of life' was reiterated (Littig, 2012). Most recently, the SDGs (Sustainable Development Goals) were created in Agenda 2030, Goal number 5 address gender equality clearly as a goal (number 5) (UN, 2016).

Research and policy that focus on women typically depict women as overworked, vulnerable and lacking decision making power which to some extent can be supported with empirical evidence (Lei *et al.*, 2017). Culturally, communities in India and Africa often view women's role as subservient to that of men (Sultana, 2011) (Ramesh & Bhavani, 2018). However, women are not given credit in exercising agency in overcoming hardships, providing for their families and making important decisions regarding their children (Luke & Munshi, 2011). Women tend to hold a heavy burden regarding social pressures within the household and maintenance of their family's wellbeing. Without this unpaid labour rural development would not be possible. Furthermore, rather than being beneficiaries of rural development, considering their contributions, women lack access to

resources such as raw materials and money. Also women often become victims of 'fall-outs' of development, where the efforts by government departments or NGOs to improve rural lives miss females (Amusan & Olutola, 2017).

This highlights the importance to recognise the need for inclusive rural development that considers the lives of men women and children. Also, it must be acknowledged that the way men and women contribute to society and their communities is different so must be approached appropriately in research. The term "ecofeminism" was invented by Francoise D'Eaubonne in 1974 (Koehler-Rollefson, 2018). This term describes the unique relationship that women have with their environment and creates a gendered way of viewing human interactions with the environment.

Women are often the first observers of changes in their environment (Amusan & Olutola, 2017). They are first to detect the decreased productivity of their land as harvests decline, soils degrade and the first to notice depletion or pollutions of water reservoirs as they are responsible for meticulous agricultural work (Yadav & Lal, 2018). An ecofeminist outlook means that human and environmental interaction is considered specifically with a gendered lens. This term considers that male and female individuals have a different understanding and interaction with their environment. This approach will be useful in this study in considering the unique experiences and perceptions of rural women in India.

Women are the effective agents of livelihood diversification with regards to climate change impacts as they adapt and cope differently than men by utilising their unique knowledge and agricultural strategies (Israel and Sachs, 2013). Whilst ecofeminism is a valuable concept to consider in this study, there are some previous research papers that are radical in the way they approach ecofeminism. For example in a paper written by Moore (2011), he argued that 'women can be closer to nature because of their positions as mothers, homemakers and carers', which is understandable considering the care and attention needed to maintain agricultural land. However he stated 'by reason of which they tend to save human beings and the environment from men's domination of nature'. This is an emotionalised statement that is more of an opinion on men than a formation of empirical evidence that women interact more gently with their environment, and therefore lacks academic credibility.

Multiple studies have aimed to understand the gendered difference in adaptive capacities and vulnerabilities to climate change (Chanana-Nag & Aggarwal, 2018). However non-farming activities and their relation to climate change and their forms of adaptations are not well known.

In a paper by Goyal & Parkash (2011) there were several major barriers encountered by women entrepreneurs/ small business owners in India summarised below;

- The patriarchal - male dominated society of India. Just the fact that they are women makes finding finance to fund their ventures less likely.
- Whilst investigating the personality of female entrepreneurs/business owners Goyal & Parkash (2011) reported a lack of self-confidence and a fear of committing to their business idea. This fear related to the opinion of family members and their community.
- Women in India are less educated than men, and economically not as stable as men which reduces their ability to bear risks and uncertainties involved in a business venture.
- Unlike men, women's mobility in India is highly limited. A woman looking for resources to fund an enterprise is still looked at with suspicion. Attitudes towards supporting or being a part of a women's business venture are still biased.
- Gender roles within the family. Women in India face family obligations which leads them to the challenge of time management. Financial institutions in India have been reported to discourage women entrepreneurs on the belief that 'they can at any time leave their business and become housewives'.
- Decision making power in Indian households often lies with the male members of the household. Such as the father, husband, son, or father-in-law. The success of a female run business can be influenced by the support of the individual's family members.
- The educational level and family background also influences a woman decision to becoming an entrepreneur.
- Absence of institutional support, cooperation and help groups for women often leaves individuals with a lack of opportunity. Small businesses run by women often cannot access the resources they need for a magnitude of reasons; such as access to technology, training, and lack of innovative schemes.

- There is a lack of awareness about financial assistance in the form of incentives, loans, and schemes. Financial assistance is often misused within a household leading to further financial challenges. This financial assistance often does not reach female entrepreneurs in rural areas of India.

This summarises the societal challenges women face in India. Also, what this brings to the forefront is the need to understand not only relationships between women and their social networks; their family and community, but also the relationships these is the lack of opportunity for women in India. It would therefore be useful to understand where current employment opportunities for women exist and where opportunity is absent. These factors in turn are crucial to enabling or preventing women to venture into their own independent work.

2.5.3 Rural women

Rural women play an import role in the wellbeing of their children and families, household food security and tending family smallholdings and livestock. These roles are not only crucial to the wellbeing of their family, but also to the community and society as a whole. Whilst taking responsibility for their families women in rural India often work long hours in agriculture. Women's work is often crucial in securing household economic and food security. However women's roles in the household are often not recognised in research and policy agendas and are often seen as informal roles with little societal value (Amusan & Olutola, 2017). This denotes the need for the evaluation of pressures women feel in rural India related to family responsibility, time management and perception of their role/ purpose within a household.

Sachs (2018) noted that rural women must not be assumed to be the same. As they differ by ethnicity, class, race and sexuality. In this study it must be acknowledged that previous findings regarding the livelihoods of rural women may not be relatable to the context of this study as there is not one universal idea or concept that applies to rural women.

Following this, rural women's role in agriculture is not as widely researched as that of men. This is true for most livelihoods in rural India. Relatively little is known about the impacts of environmental and social pressure on non-agricultural incomes. Abdulai & Crole-Rees (2001) found evidence that fewer opportunities in non-agricultural activities arose in rural poorer households.

The rationale for focus on rural women in India exists because it represents regions with high population densities and complex social structures where women are disadvantaged. This study will

make efforts to understand rural women's livelihood decisions and how they cope with certain pressures in spite of their vulnerability.

2.6 How does a rural woman's livelihood activities and income portfolio impact her wellbeing?

2.6.1 Define wellbeing

Another factor this paper will consider is the wellbeing of rural women. The concept of wellbeing is an idea that is used to refer to the 'quality of life' (Gasper, 2007). According to Diener (2000), good wellbeing includes positive emotions and moods (happiness) and the absence of negative emotions (stress and depression); as well as feelings of satisfaction with one's life, feelings of fulfilment and fully functioning in daily life.

Many papers have highlighted gender disparities in India in various markers of well-being such as, mental health, physical health and access to resources (White *et al.*, 2016). In current literature, it is becoming more common to take a gendered approach in assessing impacts of climate change. For example the impacts climate change may have on women's income generating activities (Dankelman & Jansen, 2010). Also how gender roles and social networks may also influence the lives of rural women (Lakerveld *et al.*, 2015). It is mentioned that women face increased stress, with the increase in workload, to secure economic security as well as managing household responsibilities.

The current environmental and social climate in India in relation to women's livelihood have adverse impacts on women's livelihood opportunities (Yadav & Lal, 2018). As well as this, it intensifies the workload and fatigue of rural women. It has been found that this intensive workload decreases women's self-esteem and puts pressure on them to take on some high risks activities (Yadav & Lal, 2018). However, wellbeing and its determinants among women in India have not as yet received considerable attention in literature (Sinha & Ram 2018).

An aspect of Indian society that stands out as an important feature is the diverse multicultural social structure based on religion, gender and the caste system. Therefore, it is important to consider subjective well-being in such a differentiated societal setting, which marginalises women (Sinha & Ram 2018). Literature indicates that women's independent income is the key to sources of power and opportunities that improves female wellbeing (Fakir, 2008).

3.1 Introduction

The research strategy in this study will use a combination of primary and secondary data. The secondary data was selected from a quantitative household survey by DECCMA (Deltas, vulnerability & Climate Change: Migration & Adaptation) project collected in 2015 (see Acknowledgements). The primary data was designed in the form of qualitative semi-structured interviews. The quantitative household data set from DECCMA was considered as a tool to find gaps in the survey that the qualitative interviews could fill. The qualitative data set was used to address the overall aim to explore the role of livelihood activities and income portfolios in shaping women's perception of wellbeing and adaptation choices. The qualitative interview questions related to the objectives below;

1. To document the typical livelihood activities and income portfolios of women in the IBD
2. Does a woman's livelihood activities or income portfolio affect how they cope with environmental and social influences?
3. How does a woman's livelihood activities and income portfolio impact her wellbeing?

The Literature review chapter of this study identified the need for:

- Further investigation into non – agricultural employment of women in India.
- Gender sensitive research of social and environmental pressures in India and to consider the unique relationship women have with their surroundings.
- A greater understanding of the vulnerability and wellbeing of rural women, considering the multidimensional complex nature of both factors. As well as recognising the interplay between social factors, environmental influences and livelihood choices.

This research will benefit Indian policy makers, academics and anyone with an interest in gendered perceptions of communities in rural India. The data synthesised in this study will have great value to the academic community of gender and environmental specialists. It is a growing field with the need for deeper understanding of women perceptions and wellbeing in relation to their social network and environmental pressures.

It was important in this study for the researcher to gain a deeper contextual understanding regarding the livelihoods of rural women in India. It was decided that the quantitative data set from DECCMA was not to be used alone as semi structured interviews can delve deeper into the ideas relating to perception, wellbeing and adaptation that household surveys cannot expose.

This chapter will be structured into the following sections;

- Study Area – This section gives the location and background information on Dulki village, the chosen study area, and why it was selected.
- Data – This section is split into quantitative and qualitative sub sections. The chosen research strategy is explained and justified. The intended sample population and how the study targeted the population is explained. The selection of variables chosen to analyse is justified and related to aforementioned aims and objectives. The interview process is described in detail.
- Analysis – This section gives detail to the proposed analysis of both the qualitative household survey data and the qualitative semi-structured interviews in relation to the aim and objectives of this study.
- Ethics – This section addresses ethical issues from this study.

3.2 Study Area

The study area is Dulki village, West Bengal, India. Dulki is in the North West border of the Sundarban National Park. It is located in the 'buffer' zone which is the border between where human activity is restricted in the national park and human settlement. Please see information on the IBD in the Introduction (Chapter 1).



Figure 2- Map of the Indian Bengal Delta

Source: <http://generic.wordpress.soton.ac.uk/deccma/countries/ganges-brahmaputra-delta/>

3.3 Data

3.3.1 Quantitative

The quantitative data used in this study was obtained from a DECCMA project. The DECCMA project is a five year project focusing on 4 major global deltas, with the IBD being one of them. All the quantitative data in this study is from the household survey data collected by DECCMA in the IBD that has not yet been published. The household survey data was collected in 2015, the DECCMA project will be complete in November 2018. The data used was household surveys completed by females within the household.

The DECCMA survey was specifically designed to be a gender sensitive household survey, meaning the aims and objectives of the survey coincide with those of this paper. The consideration of gendered perception and differences were key to the formulation of the survey, research strategy and methodology employed to the collection of the DECCMA household survey. The survey was carried out in 1500 households across the IBD including the study area for the interviews, Dulki. This gender sensitive approach is appropriate to this study as the results taken from this household survey will be non-biased towards the opinion and influence of men and will have ensured women to have a fair equal and equal chance to express their opinion. This is important as a lack of representation of women in research consequently, when used in practice could unintentionally enhance existing gender disparities (Tanner *et al.*, 2015).

The DECCMA project has a large variety of aims and objectives however the following describes which aims relate to this study and why.

DECCMA set out to 'understand the conditions that promote migration and its outcomes, as well as gender-specific adaptation options for trapped populations'. This objective concerns gender specific adaptation and choices which related to the Objective 2 of this study 'does a woman's livelihood activities or income portfolio affect how they cope with environmental and social influences?' Another DECCMA objective is 'to understand how climate-change-driven global and national macro-economic processes impact on migration of men and women in deltas'. This objective can be related to Objective 1 'to document the typical livelihood activities and income portfolios of women in the IBD' to establish if women migrate to support their livelihood and opinion on women working away from the household. DECCMA also have an objective 'to conceptualise and evaluate migration within a wide suite of potential adaptation options at both the household and delta level', this can also be related to Objective 2 of this study 'does a woman's livelihood activities or income portfolio affect how they cope with environmental and social influences?' Although this focus is on migration the objective to observe household level adaptation options through a gendered lens can coincide with

Objective 2. The final DECCMA objective to be discussed is the objective ‘to identify feasible and desirable adaptation options and support implementation of stakeholder led gender-sensitive adaptation policy choices’. This objective can be linked to Objective 3 of this study ‘how does a woman’s livelihood activities and income portfolio impact her wellbeing?’. To identify feasible and desirable gender specific adaptation options, it must be investigated what struggles women face due to their livelihood and income choices and what factors determine these choices.

Variables were selected from the DECCMA household survey. The variables were in the questionnaire sections;

- Material wellbeing
- Subjective wellbeing
- Personality
- Place attachment and social networks

The reason these variables were selected was to gain an initial insight into the wellbeing, decision-making power and social environment of women in the IBD and what challenges they currently face. Percentage frequencies were calculated to highlight the most common opinions and feelings towards the above variables. Discrepancies between male and female headed households will be identified. This knowledge will then be used to formulate an appropriate qualitative analysis.

3.3.2 Qualitative

Several research papers have encouraged the use of qualitative research methods when exploring factors influencing the lives of rural women (Ganle *et al.*, 2015)(Routray *et al.*, 2015). The aim of this study is to explore perceptions of rural women concerning their livelihoods and income, an understanding on an individual level is necessary to build knowledge of women’s perception within the community. As mentioned in the Chapter 2: Literature Review, social networks and cultural norms are an important factor in the creation of work opportunities for rural women. Semi structured interviews are the most suitable way to gain an insight into female perception of such factors, as participants are given an opportunity to discuss issues that are most important to them personally.

The qualitative data collection for this study was conducted in the Indian Bengal Delta (See Figure 2). The data collection took place between the dates of the 5th- 8th June 2018. The semi structured interviews were designed to address the research aim. Interviews focused on past and present perceptions of women of their wellbeing and adaptation strategies, including the role of livelihood activities and income portfolios. The study included semi structured interviews that were carried out

with female participants. The village of Dulki was chosen to carry out the interviews. This was because of its easy access. Due to it being monsoon season certain areas of the Sundarbans were too dangerous for researchers to access.

Interviews were conducted using a translator. 17 interviews were conducted and were between 20-45 minutes long. A local guide was present to navigate around the households and identify the female participants. The interviews consisted of 6 semi-structured questions. The way the questions were phrased varied and prompt questions were used according to each participant's individual responses. The questions explored livelihood activities of participants and their feelings towards these activities. The questions were also designed to address the impact that the monsoon season has on an individual's livelihood and income. Participants were asked about their coping strategies during the monsoon season and their perception of which livelihoods are impacted by the monsoon season. The interviewer also enquired about the participants views of women working or owning their own businesses, and other members of their family/community opinion.

Female participants were predetermined. DECCMA researchers, who had previously visited the village of Dulki, identified female participants that had been found in a census the team carried out.

Interviews were audio recorded. Translation occurred during the interview whereby the translator summarised each answer given by the participant to allow for any follow-up questions. Full transcription of the interview occurred after the fieldwork each day.

The interview transcriptions were then taken through a coding process. Attride Stirling's (2001) thematic analysis technique was used in coding the interviews collected in this study. Thematic coding was chosen to analysis the interviews because it's a systemised method to extract themes from text. After all interviews were transcribed, the 17 interviews were read thoroughly (x3). Following this, the interviews were summarised, meaning only information related to the aforementioned aims and objectives was taken forward. NVivo 12 coding software was then used to identify emerging themes, until 'theoretical saturation' is reached. Theoretical saturation is reached in coding when no new concepts will emerge from further coding. Major themes will be deciphered. Sub-themes will be identified to allow for a structured presentation of the data in the Results Chapter and a use of quotes from the interviews will be used to show 'true fit' of the data into the themes.

3.4 Ethics

This study was approved by the ERGO 2 (Ethics and Research Governance Online) ethical considerations of The University of Southampton (ERGI+O number: 41190). All participants were

made aware of the ethical details of this study and were well informed before giving consent. All interview were confidential and no personal details were detailed disclosed in this paper. Participants were referred to by interview number to ensure they remained anonymous. This study is within the University of Southampton's Ethics Policy. To gain further information please see Appendix 6, 7 and 8.

Chapter 4: Results

4.1 Introduction

This chapter describes the results of the quantitative and qualitative data collection. The quantitative data was selected from the DECCMA household survey data. The qualitative data was the 17 interviews carried out in Dulki, West Bengal, India. The quantitative data focuses on the material wellbeing, subjective wellbeing, personality and place attachment and social networks of women in the IBD. The quantitative DECCMA household survey was carried out in 1500 households in the IBD. The percentages referred to in this chapter are valid percentages that are taken from the total number of households that responded to the question (See Appendix 5). Within the four selected sections from the DECCMA survey; material wellbeing, subjective wellbeing, personality and place attachment and social networks, the meaning of each question will be explained. It must be noted that this survey was translated into Bengali so the context that was understood by the participant might differ to that of the researchers that developed the survey.

Following this, the qualitative research focuses on the primary research objectives. It will document the typical livelihood activities and income portfolios of women in the IBD, how a woman's livelihood or income affects how they cope with environmental and social influences and how a woman's does livelihood and income impact her wellbeing. The quantitative research and the qualitative research can be closely related. The quantitative data was processed to gain an insight into the research gaps present in the DECCMA household survey data. The qualitative research was then designed to be more focused and in depth in addressing the objectives.

Description of the quantitative and qualitative data will be approached in a structured manner. Firstly the quantitative data will be analysed by descriptive statistics using frequencies. Secondly, the gaps in the household survey will be identified. Finally the qualitative interview data will be described using thematic coding.

It is in the setting of wellbeing, perceptions livelihood and incomes and adaptations in which this study is implemented. It should be acknowledged that the quantitative study is a large household

survey dataset from multiple villages in the IBD and the qualitative data is interviews from one village within the IBD (Dulki).

4.2 Quantitative Results

4.2.1 Material Wellbeing

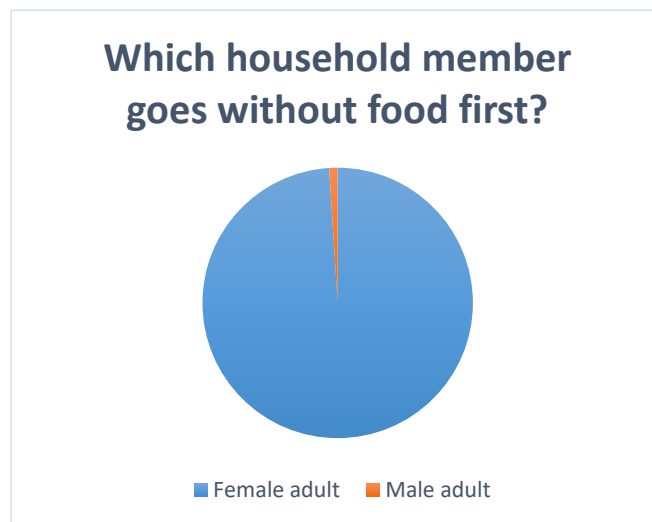


Figure 3- Pie chart showing which member of the household goes without food first

As shown in Figure 3, in 98.4% of households that participated in the survey a female adult was the first member of the household to go without food.

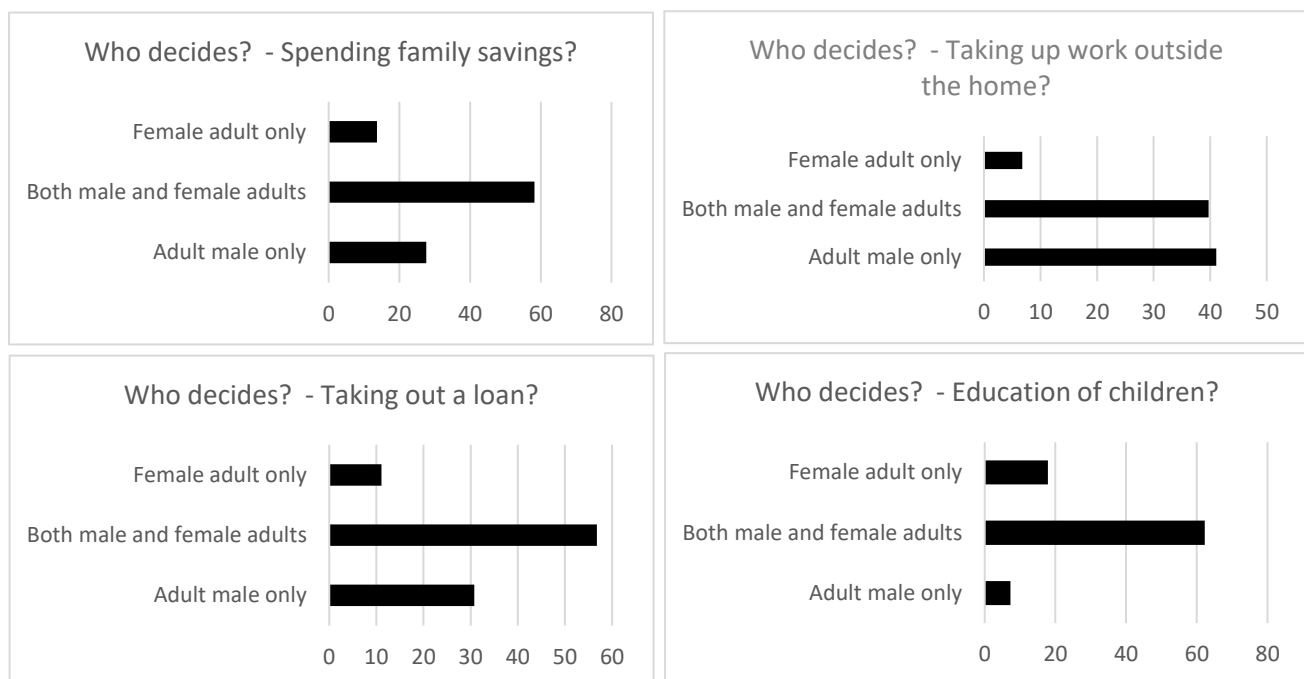


Figure 4- Graphs showing decision making power of adult males and females in the IBD

In Figure 4 it is shown that in 58.2% of the households that participated in the survey both the male and female adults had joint decision-making power when deciding how family savings were spent. In 27.6% of the households only the male adult of the household had the decision power over family savings and in 13.7% of households only the female adult had decision making power over the family savings.

In 56.8% of the households that participated in the survey both the male and female adults had joint decision-making power in taking out a loan. In 30.8% of the households only the male adult of the household had the decision power over taking out a loan and in 11.1% of households only the female adult had decision making power over taking out a loan, as shown in Figure 4.

In Figure 4 it is also shown that in 43.3% of the households that participated in the survey both the male and female adults had joint decision-making power when deciding to take up work outside the home. In 46.0% of the households only the male adult of the household had the decision power over taking work up outside the home and in 7.6% of households only the female adult had decision making power over taking up work outside the household.

In 62.2% of the households that participated in the survey both the male and female adults had joint decision-making power over the education of children. In 7.3% of the households only the male adult of the household had the decision power over the education of children and in 17.9% of households only the female adult had decision making power over the education of children.

4.2.2 Subjective Wellbeing

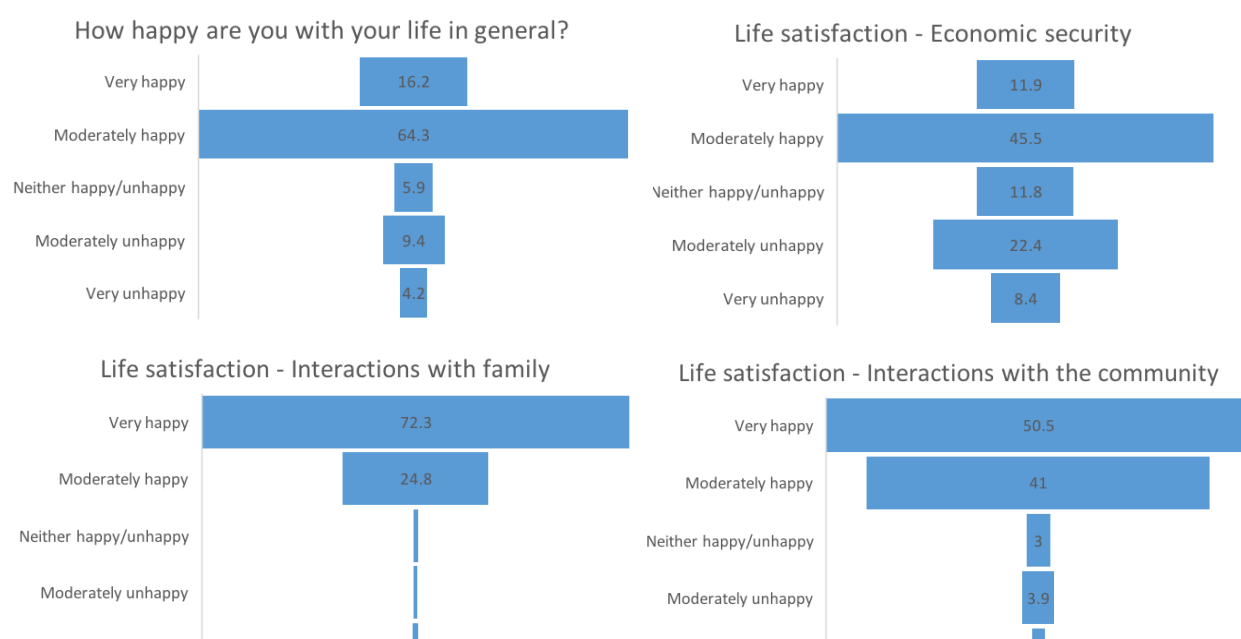


Figure 5- Graphs showing happiness and life satisfaction of women in the IBD

In female headed households, women are not as happy as in male headed households. Overall 16.2% of all households individuals are very happy and 64.3% of individuals are moderately happy.

In female headed households, a higher percentage of women are very unhappy than in male headed households and a lower percentage of women are very happy in terms of economic security.

However, in male headed households 45.4% of women are moderately happy, and similarly in female headed households 46.2% of women are moderately happy with their economic security.

Overall, in both male and female headed households, 45.5% of women are moderately happy.

In male headed households there is a higher percentage of women who are very happy with interactions with family than in female headed households. However, overall 97.1% of women are moderately to very happy with their family interactions. A higher percentage of women are very unhappy with their family interactions in female headed households than women in male headed households.

As displayed in Figure 5, 50.5% of women are very happy with their interactions with the community and 41.0% are moderately happy with their interactions with the community. A higher percentage of women in male headed households are very happy with their interactions with the community than women in female headed households.

4.2.3 Personality



Figure 6- Pie charts showing levels of agreement with statements regarding personality traits of women in the IBD

As shown in Figure 5 69.6% of women agree a little or strongly that they are relaxed and handle stress well. 29.9% of women disagree a little or strongly that they are relaxed and handle stress well. A higher percentage of women in male headed households agree strongly that they are relaxed and handle stress well than in female headed household. A higher percentage of women in female headed households disagree strongly that they are relaxed and handle stress well.

Overall 54.2% of women agree strongly that they are open to new experiences and 34.9% of women agree a little that they are open to new experiences. Overall 9.5% of women disagree a little or strongly that they are open to new experiences. A higher percentage of women in male headed households agree that they are open to new experiences. A higher percentage of women in female headed households disagree that they are open to new experiences (See Figure 5).

As shown in Figure 5, 63.1% of women agree strongly that they like looking for better ways of doing things and 29.7% agree a little that they like looking for better ways of doing things. Overall 6.7% of women disagree a little or strongly that they like looking for better ways of doing things. A higher

percentage of women in male headed households agree that they like looking for better ways of doing things than in female headed households. A higher percentage of women in female headed households disagree that they like looking for better ways of doing things than in male headed households.

Overall 41.1% of women agree strongly that they feel comfortable making big decisions and 31.9% agree a little that they feel comfortable making big decisions. Overall 11.0% of women disagree strongly that they feel comfortable making big decisions and 15.4% of women disagree a little that they feel comfortable making big decisions. A higher percentage of women in female headed households agree strongly that they feel comfortable making big decisions than in male headed households. This is the only discrepancy between male and female headed households (See Figure 5).

4.2.4 Place Attachment and Social Networks

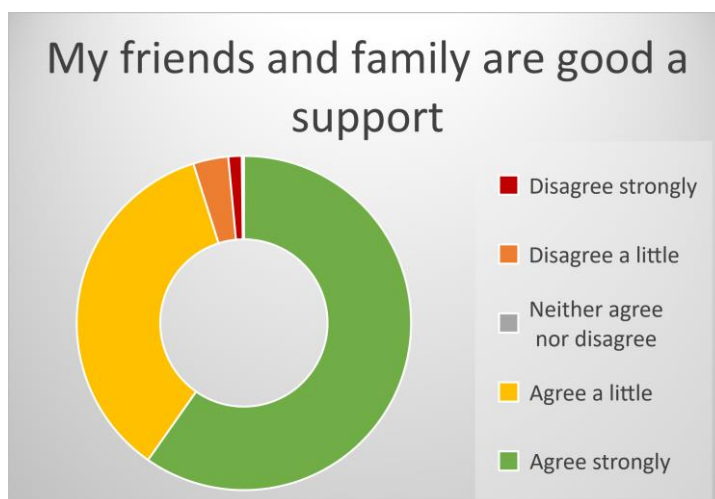


Figure 7- Pie chart showing levels of agreement with friends and family support of women in the IBD

As shown in Figure 7, 59.7% of women agree strongly that their friends and family are a good support and 35.4% of women agree a little that their friends and family are a good support. Overall 4.7% of women disagree a little or disagree strongly that their friends and family are a good support. There was little difference between answers of male and female headed households.

4.3 Gaps found in the DECCMA household survey (Links Quantitative and Qualitative)

The DECCMA household survey is a valuable dataset that can be used to quantify many aspects of the quality of life, wellbeing and social pressures that women face in the IBD. However, when utilising this type of raw data it can be challenging to put the data into context. For example, to

quantify levels of happiness, place attachment and social networks allows for an insight into the wellbeing of women. Although it gives no indication to the reasons behind happiness or unhappiness. Household surveys do not give informants the opportunity to explain their reasoning behind the answers they give and also do not explain the context and relevance of the survey questions to informants (Carr, 1994). In order to investigate further into the initial findings of the DECCMA household survey, qualitative research was required (Please refer to the Methodology Chapter for detailed limitations to the DECCMA household survey).

Denzin and Lincoln (1994, p. 2) stated 'Qualitative research is multimethod in focus, involving an interpretive, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them.' This statement highlights the importance of the involvement of people when interpreting social challenges. This qualitative aspect of this study will aim to investigate in more depth the livelihood activities and income portfolios of women in Dulki village, West Bengal and the pressures they feel in relation to their wellbeing.

All research gaps identified from the DECCMA survey below remain in context with this study's objectives (that are previously stated).

Material wellbeing

The variables selected from the 'material wellbeing' section of the DECCMA household survey were in relation to household decision making (financial and children) and also who goes without food first in the household. Material wellbeing is one-dimension of individual wellbeing, regarding the resource available to an individual. It is important that access an individual has to these resources is determined. The qualitative study questions were designed to gain insight into the women's feelings surrounding household decision making and their livelihoods and the challenges that surround these factors.

Subjective Wellbeing

The variables selected from the 'subjective wellbeing' section of the DECCMA household survey were in relation to the happiness the informant feels. General happiness, satisfaction with economic security, family interactions and community interactions were included. General happiness levels are valuable as happiness can be an indicator of overall wellbeing of the female participants. Satisfaction with economic security can relate to livelihood security but give no detail regarding feelings and management of household economic security. Family and community interactions were also quantified. However, to build up an understanding of the social networks a female has with her

family and community, in depth questions must be posed. The qualitative study questions were designed to explore women's feelings associated with their livelihood practices, methods of coping with economic security or weather variability. The questions were also designed to explore the social networks that women have and how these networks influence the wellbeing and livelihood choices women make.

Personality

The variables selected from the 'Personality' section of the DECCMA household survey were in relation to traits such as handling stress and openness to new ideas and making important decisions. These traits possibly give an insight into how independent the female participant is or how comfortable they are with their current living situation. To understand the reasons behind why these women have developed certain traits in their personality, the qualitative study questions were designed to explore the pressures women feel in relation to their livelihood practice/s and how this affects the decisions they make.

Place attachment and Social Networking

The variable selected from the 'Place attachment and Social Networking' section of the DECCMA household survey was concerning the support that the female participant feels from their family and friends. In context with this study's objectives the qualitative study questions were designed to gain insight into the social challenges women who work have to face and what social norms are projected by their family or community as well as opinions on working women.

4.4 Qualitative Results

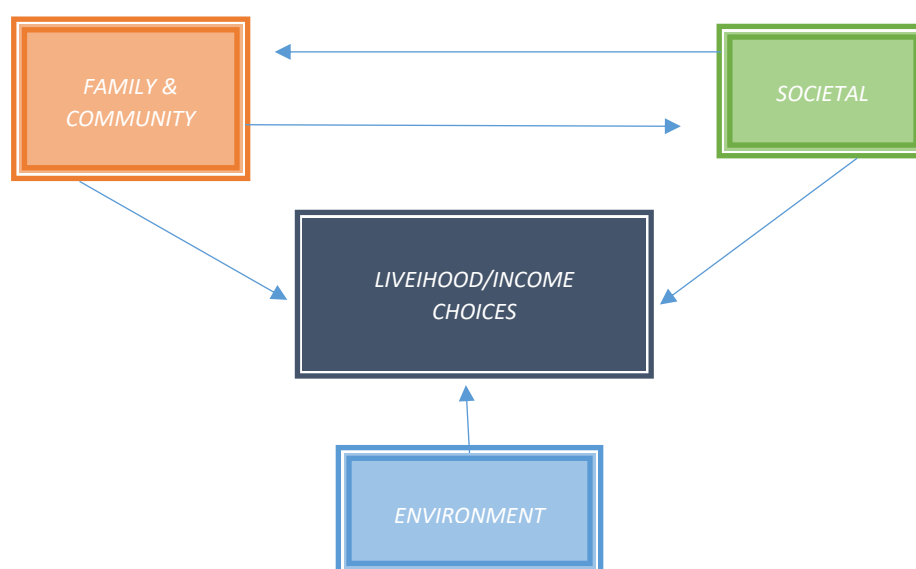


Figure 8- Factors of individual wellbeing diagram

Using the above diagram of ‘factors of individual wellbeing’ the interviews findings will be summarised, using example extracts, in the following categories:

- Family and Community
- Societal
- Environment
- Individual livelihood and income choices

• Interview Number	Occupation/s
1	Shrimp collection, Agricultural work
2	Shrimp collection, Agricultural work, Small land holding
3	Tailoring, Agricultural work
4	Agricultural work, Tailoring
5	Agricultural work
6	Past: Tutor and Tailor (BM)
7	Agricultural Work
8	Rearing Livestock, Agricultural work
9	Vestige company, Past: Tailoring
10	Tailoring (thread work)
11	Agricultural work, Small land holding
12	Agricultural work, Past: Fishing work
13	Tailoring, Small land holding, Agricultural work
14	Past: Tailoring, Agricultural work, Small land holding
15	Rearing Livestock, Cook at a school
16	Teacher and Childcare, Care for pregnant Women (Government funded)
17	Tailoring, Past Agricultural work, Small land holding, Beautician work

Table 1- A table showing the livelihood activities of interview participants

4.4.1 Family and community

i. Collective action and Family Unity

In agricultural work participants reported working in groups with men and women present. This is a sector that the majority of women in the village are involved in. It was well reported by participants that when working in the field there is no segregation between men and women. It is well understood in the village that women who work, work because they have to, for ‘the sake of their

families.' It is often that women work in the agricultural sector to support their husband's income. These women often refer to themselves as being from poor and needy families.

Collective action is a term that refers to 'putting aside one's own self-interest and acting on behalf of the community' (Story *et al.*, 2018), as previously mentioned. This type of understanding between men and women can be classified as collective action where people of the village work together to gain financial security. This type of community action was attributed to the governmental scheme of '100 days' work', in **Interview 2** (See Below) where they explained that the idea of unity in agriculture comes from this scheme.

Interview 2

'We work with the men in the same force. There is no segregation between men and women, this idea of unity comes from one government scheme (100 days work). The government have allowed both male and females workers'

'I earn 1000 rupee for one week of working in agriculture. If my husband and I work together we get 2250 rupee'

In **Interview 7** (See Below) the participant reported that her boss, who works in the field alongside her, allows her to go home during heavy rain and is understanding that such conditions are too challenging to work in. In **Interview 14** (See Below), the participant mentioned that she is working to improve the lives of not just her family but the community.

Interview 7

Interviewer: 'When you go home during heavy rain, do have problems from your boss?'

Participant: 'No, they allow me to go home because they also work alongside us so they can see we cannot work in such conditions'

Interviewer: 'As a women, do you face any problems in the field?'

Participant: 'No, both male and female work together in the field'

Interview 14

Interviewer: 'If your husband earnt enough would you still work?'

Participant: 'Yes, I would try and earn something because it's not only about my family's needs. I would like to help other people in the village.'

In the interviews it became evident that families often unite and take on their financial burdens together. For example in **Interview 5** (See Below) the participant spoke of her family maintaining their lifestyle by all working so there is not pressure on one person (the male of the household).

Interview 5

Interviewer: 'So what's your view on women who work independently?'

Participant: 'I think it's good, women should do something. I can help my husband so he can benefit from my work. If everybody earns in my family we can share the income and maintain our lifestyle and there will not be pressure on one person. If I was the only one earning 250 rupee per day would be spent on cooking ingredients. This would make it hard to maintain our lifestyle or to save money.'

In **Interview 8** (See Below) the participant said they were happy to be working together as a family and community, and acknowledged that the responsibility of their family cannot be 'one person's job'. When talking to the participant in **Interview 9** (See below), they discussed the unity of their family and how their family's support makes it easier to cope with the negative perceptions from other members of the community on working women. This woman worked in a vestige company that meant she had to travel to Kolkata and neighbouring villages to generate an income. This participant had an aspiration to further develop her business and take future business opportunities to share the financial pressure with her husband.

Interview 8

'One person cannot run this family. I am very happy that we are working together to earn. In the agricultural sector we work together and we are happy. However, it's not my own land.'

Interview 9

Interviewer: 'Do you face any challenges as a woman with a business?'

Participant: 'No, I do not have problems. Sometimes people have negative comments. But I don't care, I have my family's support.'

'One day I hope my income will be more than my husbands, I want to do more. If I didn't work the responsibility would be on my husband's shoulders, which would be a problem.'

Interviewer: 'If you had a better opportunity would you take it?'

Participant: 'Yes I would, I'd keep this business and so other work if I had the opportunity.'

Interview 11

Interviewer: 'Why did you stop fishing?'

Participant: 'I left because of the dangers. I am scared of the crocodiles and tigers. We used to all go together but now everyone has stopped because they are scared. Sometimes I want to go but I don't want to be the only one. We used to go as a community.'

ii. Gender Roles/ Social Norms

Gender roles within families and the community are being redefined. During interviews there were aspects of open mindedness when it comes to women taking up a working role, that might traditionally be a male role. It often seemed that changes in gender roles were due to financial pressures on the family or household. In a sense, the more pressure there seemed to be on a family the more acceptable for women to take up work outside of the household, and the less judgement made by fellow community members. In **Interview 3** the participant explained that women 'must' go to the field and work together when being from 'poor and needy' families.

Interview 3

'During the monsoon there is no work here for women apart from agriculture. In this community the women don't make enough money. Our husbands do not have enough money to sustain our family. So women must go to the fields together as we are poor and needy. Everyone wants to earn but also be with their children. In spite of the pain, we must work!'

Women feel pressure to take responsibility for their family. Women feel that that is a very important factor behind their livelihood decisions and often say they would not work if their husbands income was substantial enough to support their family's needs. In **Interview 5**, the participant mentioned that lots of women have the same mentality regarding working to secure the wellbeing of their families.

Interview 5

Interviewer: 'What do other people think of you working in the field?'

Participant: 'There are no problems, we all work together and we are very happy working. We all have the same mentality; to work for our families.'

Women of Dulki village have a variety of responsibilities in the household and to financially contribute to their family's incomes. In **Interview 1** (See below) the female talked about being a housewife and working simultaneously, because she 'has' to.

Interview 1

'Housewives and working women are both important in society. I have to do both simultaneously.'

During **Interview 2** (See below) the participant worked and had the responsibility of caring for their husband and children. She said she wanted her future daughter in-law to work outside of the household. When asked about her opinion on women who work she talked about her own situation and explained it is good for her to work so that she is not a financial burden to her husband, she works to give the money to her husband, who then decides how the money is spent.

Interview 2

Interviewer: 'Do you feel and social challenges working in the field?'

Participant: 'No, I do not face any kinds of discrimination. Both genders are equal in the field. If I had a daughter in law at home with me then I would want her to work in the field and she can easily go to the field. If a women is the only women in her house then she may not go to the field as she must be home to look after her husband and children.'

Interviewer: 'Do you think your situation is better than a housewife's?'

Participant: 'My life is good, I am not involved in gossiping I focus on my work and do not have time to visit other houses. I am not a burden of my husband and I earn for myself and my husband is happy with me. If I want to purchase something I can. I am very proud that I earn money and hand it over to my husband so my husband purchases the things I need.'

Many of the female participants stated that women are 'allowed' to work in the agricultural sector alongside men. However when it comes to non-agricultural work further afield, the male members of the household leave the village and the females stay behind. For example in **Interview 3** (See below), the participant says she cannot go to town to earn and would rather be a housewife than work.

Interview 3

Interviewer: 'So not many women stay in the home here?'

Participant: 'No, all women must go to the field and earn something.'

Interviewer: 'Is there separation between men and women in the field?'

Participant: 'No, there is no questioning why women work outside of the home in this area. Sometimes, our husbands or sons go to the town and when they do I stay at home, I cannot go to the town to earn. I stay home and tailor. I can feed myself with my earnings.'

'If my family have enough I would be a housewife, I would prefer to be a housewife than work.'

Women of the community are responsible for childcare. This can be challenging for women who work or are the only female in a household. Women who work were concerned about who will take care of their children when they are working. A woman who is the only female of the household, without a mother-in-law or sister present, often lacks the opportunity to work because of their household responsibilities. Without the presence of another woman these responsibilities hold them to stay within the household. In **Interview 4** (See below) the participant discussed the females of the community taking care of her children when she worked and the pressure she felt to get home from the field as soon as she could. She also, like many other participants, stated that she would like to be at home to be with her children. The participant in **Interview 6** (See below) similarly mentioned that the presence of her mother helped her to focus more on her work and assisted her with her household responsibilities. Following this it was acknowledged that participants with daughters were more concerned than that of participants with sons.

Interview 4

Interviewer: 'Who takes care of your children when you are at work?'

Participant: 'My mother in-law or my neighbouring aunt. I return from the field as early as possible.'

'In order to sustain my family I had to work in the field. After my children were born I had to manage them as well as working in the field.'

'It is easier to cope when I work. This work makes it easier for me to adapt to the harsh financial conditions.'

'I would like more time in my home if I didn't have to go to the field, so I can stay at home and be with my children'

Interview 6

Interviewer: 'How do you manage household work and your business?'

Participant: 'When my mother worked in the field, I did the household work and my tailoring work. When my mother is home I can focus on my work'

In most cases, women's income was spent partially on their children's wellbeing and materials for their development such as school cost. The presence of children in a female's life seemed to change the pressures that women feel, when women have children it added to their stress levels due to challenging time management.

Female financial independence was conveyed to be very important by many participants. In

Interview 7 (See below) the participant was very happy due to her financial independence and the way it benefited her and her family. It was also mentioned that women work to secure financial security when they are old, as their children are moving away and no longer providing for them in their old age (see **Interview 8** below). During **Interview 15** (See below), the participant spoke about how times were changing, parents are no longer depending on their children to provide for them financially in their old age.

Interview 7

'When I had young children I could not go to the field, but now they are older I can. My daughter is 16 so now it's OK. When my daughter was 2 I worked in the field and my mother in law looked after her.'

'I am happy to be an independent woman, I help my family'

Interview 8

Interviewer: 'As a working women, do you face any problems?'

Participant: 'In the past, yes. However, nowadays there are no problems. When I got married women used to question I work in the field. I told them I am from a needy family I cannot depend on my husband. All family members must work. I wonder who will look after me when I am old so I save this money for my future.'

Interview 15

Participant: 'I'd like my daughter to earn some money after she gets married. She can then have what she need. I don't have any problem with her working in the field or a government sector. I'd like her to work in the future.'

Participant: 'These days things are changing. When I get old there will be nobody to take care of me. I must save for my future so I don't have to depend on my son. I want to save so my son can have an inheritance. These days after our sons get married they often leave. Then the parents are left to look after themselves.'

The participant in **Interview 11** (see below) became emotional when discussing the struggle she faces physically when working in agriculture. After being asked why she stayed in the village despite the constant struggles she described she claimed it was all for her family and the reason behind everything she does is the sake of her family. Many women described attachment to the village community through family responsibilities and explained that family ties are the reason behind them staying in a place with few employment opportunities. Women push through difficult employment circumstances, such as physical challenge, for the sake of their family.

In **Interview 12** (see below) the participant was happy because her family offered her support to work. She discussed her responsibility to manage her family regardless of other people's traditional views that women should remain in the household carrying out household chores.

Interview 11

Interviewer: 'Why do you stay here with all these problems?'

*Participant: 'When I die I want to die with my husband and children, here.
Without them my life is nothing.'*

Interview 12

Interviewer: 'As a working woman do you face any challenges?'

*Participant: 'No, nobody bothers me. This is my family and I have to manage it.
They have needs and I work for the sake of my family. Some people are negative
but I just ignore them.'*

Interviewer: 'Does your family support you?'

Participant: 'Yes they do'

iii. Opportunities for Women

There appeared to be a lack of opportunity for women in Dulki village. Multiple female participants reported that they would like to be engaged in small businesses such as tailoring or opportunities further afield but claimed no opportunities were available to them, or they were not aware of such opportunities. Women were interested in learning new skills and employment opportunities but were either not engaged in such activities or not aware of such activities.

Different parts of the village were aware of different types of employment, some women were aware of opportunities in the tailoring business and other women controlled asset management. However, some women claimed that agricultural work is the only opportunity for them to gain an independent income.

Religious groups brought opportunity with church leaders recruiting women for activities such as tailoring. The participant from **Interview 3** was recruited by a Christian church leader to learn how to tailor and eventually use those skills to gain an income. The opportunity was not paid but materials and a sewing machine were supplied by the church. Women had the opportunity to gain 1 year of tailoring experience and skills building. Opportunities to work in agriculture were often spread through social interaction, most women who worked in the agricultural sector received information about work in other people's fields directly from interacting with the land owner or a current employee. The participant in **Interview 9**, who was a part of a vestige company, got her employment opportunity from a father in her Christian church who travelled to Kolkata on her behalf to secure the job.

Women's opportunities are often influenced by aforementioned family and community attitude. Women who don't have the support of other women lack in opportunity due to being bound to

household work. In **Interview 2** (see below) the participant discussed the pressure to be at home and take on her household responsibilities. She also had a desire to take up employment, so long as she could remain in the household but she was unaware of any opportunity. It was often found that women would support the males of the household to take employment opportunities rather than consider them for themselves due to their family responsibilities. In **Interview 9** the participant said she would only take an opportunity to work in Kolkata to expand her business if she had her family's support. The female from **Interview 11** (see below) thought that the lack of unity between women of the community was a factor that hindered her from developing a business.

Interview 2

Participant: 'If I work inside my home it would be better but there are no kind of jobs. Such as hand crafts or making something but I don't have the opportunity. So I have to go to the river and face risk'

Interview 11

Interviewer: 'Do you think you could start a business?'

Participant: 'There is no unity between women, so it is hard. I have tried. In our village there are groups but not for developing businesses. Most women are involved in agriculture'

Women wanted to work from home to manage their responsibilities and to avoid possible physical challenges related to agricultural work. In **Interview 3** (see below), the participant stated that agricultural work was the only employment opportunity that women in the village have. This work involved physical stress and time pressure and she seemed overwhelmed when discussing her employment decisions.

Interview 3

Participant: 'There is no other work for women, I will have to face any problems.'

Opportunities for women to work during the monsoon season are not available currently. Again, women feel like the agriculture sector is the only employment sector available to them during the monsoon season, as mentioned in Interview 3.

Skills learnt from the participant's time in education often meant that they are more likely to gain employment opportunities. For example, the female participant in **Interview 4** learnt tailoring skills in school, which she now uses to generate extra income. Without these skills women were often left

unemployed. When talking to a participant (**Interview 6**, see below), who used to tutor before her marriage, she mentioned women's literacy skills being a factor that influences their employability. The participant thought that because she was literate and her mother and aunt were not she had greater opportunities to work than they did.

Interview 6

Participant: 'I am literate but in our village other women like my aunt and mother so they cannot do what I do. They have to work in the field as there are no other opportunities for them'

Women are not willing to travel further afield for non - agricultural employment opportunities. For example in **Interview 5** when asked if the participant would travel to Kolkata for work that paid more, she said she would not move due to family responsibilities despite her dissatisfaction with her current work (agricultural work).

This lack of opportunity seemed to have an impact on women's motivation and desire to find employment. During **Interview 7** (see below) the participant seemed unhappy. When asked what activities she would like to do she replied that there are no opportunities for her.

Interview 7

Interviewer: 'What would you like to do?'

Participant: 'There are no opportunities for me'

iv. Women's attitudes

The attitudes of employed to those women who are unemployed were often negative and condescending. Employed participants often said they feel misunderstood by 'housewives' who are 'jealous' of their freedom to work, without acknowledging the hardships working women face. This leads to a lack of unity, which affects the social cohesion between women who are employed and women who are unemployed in the village. The participant in **Interview 6** (see below) felt that nobody in the community supported one another's work.

Interview 6

Participant: 'Nobody is well-wisher in this area.'

The participant in **Interview 1** (see below), talked of the negative comments she received from other women in the community. Women often talked about negative comments when asked about social problems they face but were mostly not phased by other women's attitude and relied on the unity

of their family for support. This lack of unity between women, seemed to be reflected in groups of women who received loans from banks or the government to start small scale businesses. This often led to the misuse of money.

Interview 1

Participant: 'I feel that I am superior to women who are not involved in economic activity. Other women think I am too different but I am not listening to what they say. This is a normal problem for women who earn'

On the contrary, many participants recognised the value of women who remain in the household to tend to their family's needs and assets, such as livestock. For example in **Interview 1** (see below), the participant recognised the importance of women who work and 'housewives' in society.

Interview 1

Participant: 'Housewives and working women are both important in society. I have to do both simultaneously'

Despite the segregation found between different groups of women, women who worked together in the field in the agricultural sector were supportive of one another, due to their mutual motivation of providing for their families. The interviewer asked the women if their husbands earned enough, would they still work to generate an independent income. The majority of women interviewed said they would not work if their husband could provide for their family alone, due to the physical stress that their livelihood brought them. However, women who work were happy with the changes their independent income brought to their lifestyle and felt more empowered by this income (see **Interview 12** below). Women who don't work reported feelings of isolation and lack of fulfilment.

Interview 12

Participant: 'When I am working I am not feeling helpless.'

Women's attitudes to female employment are changing within the community within different generations. Many participants who were mothers supported their daughters to gain independence through working, for their own financial security and wellbeing. Older women recognised the struggles they faced from negative opinion of others when working, and accepted that things have changed for their children and those type of attitudes are fading. Women were reported to be resourceful and capable of coping with stress.

4.4.2 Government Initiatives and Women's Groups

There were a variety of women's groups in the village. As aforementioned the government initiative named '100 days work', gives women the opportunity to work in the agricultural sector, with men. However there were cases where people reported the individuals were not being fairly paid and the discontinuity of the work, so people did not rely on this work as their sole income.

Other groups gained loans from the government for financial support. However women often said they find it challenging to repay the loan along with its interest. Some participants had to take out a loan or mortgage their belongings, in order to repay the governmental loans due to financial difficulty and sometimes misuse of the money. Following this, some loans had a high interest rate that left women in financial difficulty.

Women were not advised on the use of the governmental loan and reported that the large amount of money was an overwhelming responsibility. The lack of financial advice meant that governmental loans given to women to begin small business ventures was not utilised in the correct way. For example during **Interview 11** (see below), the participant mentioned she used these loans for her family's needs rather than investing in a business venture. This was common in the majority of interviews where this money was used for family needs of household. It was due to her lack of skills, she was not confident to use the money to invest in a small business idea.

Interview 11

Participant: 'I use this money for my family. I am do not have the skills and I am not literate.'

The misuse of this money was also associated with the lack of opportunity for women in non-agricultural work, such as tailoring. Some women gave the money to their husbands to use. See below in **Interview 2** where the participant mentions the lack of opportunity to utilise the government loan.

Interview 2

Participant: 'There are no opportunities for me and that is why the money is not utilised'

Women also had different ideas within the groups that were given the money so no agreed idea was maintained to begin a small business, participants all said they had different ideas on how to use the loans.

4.4.3 Environment

The changes that participants had witnessed in weather conditions and physical environment was not a topic frequently discussed during the interviews. However, it was mentioned in **Interview 1** (see below) that the participant had noticed an increase in water levels at the riverside. They said that they believed this changes the species of animal and plant distribution. Meaning there are more shrimp, and also crocodiles.

Interview 1

Participant: 'There are more crocodiles. Cactus trees get in my feet near the river side. This is due to higher water levels'

Rainfall was reported to have changed causing a variation in the growing season of crops. The monsoon season was said to be later in the year than 'normal' by participants who worked in agriculture. Participants were certain that the weather had changed but often the details of temperature, rainfall and change in season varied and were conflicting between interviews and within interviews.

i. Health and Physical Wellbeing

All sectors of employment have their unique physical challenges for women of Dulki village. Women who work in agriculture reported physical pain due to physical aspects and long hours at work. Most women worked around 8-10 hours a day in the agricultural sector. Women have rashes on their skin and complained of headaches due to the heat they work in. During **Interview 2** (see below), the female participant explained the stress and physical pain she had from working in the field. She also spoke of working through storms in order to provide for her family.

Interview 2

Participant: 'I feel pain and lots of stress. I do not eat and I lack sleep because I collect fish too. But I feel that I have to manage this to sustain my family.'

'In some cases, I go in spite of heavy rain and during the lightening. In that time I cover my ears with my hands and work in the field'

Women who fished for a living were scared due to the presence of crocodiles and tigers. This was reported in **Interview 2** (see below) where the participant felt her life was at risk due to threats of crocodile and tiger attacks. Women spoke of relatives that had been either attacked or killed by

tigers or crocodiles. Also, Women who worked in agriculture spoke about leaches and snakes being a problem when working in the field.

Interview 2

Participant: 'I have to go to the river and face risks such as crocodiles. Because of the crocodiles and tiger on the opposite banks my livelihood depends on risks. I am working with my life in my hands'

Women who were involved in tailoring activities all reported having vision issues due to the delicate nature of this work and the time required to sew very detail designs. Typically it took 3-4 days to make one sari in the tailoring sector. Women said they were indoors sewing and designing for up to 8 hours every day, resulting in aches and neck pain for most women. This affects their health and ability to then take up any other form of employment due to their poor vision.

All women reported mental stress due to their heavy workload in taking upon them and their many livelihood activities. Women often came across as overwhelmed.

ii. Adaptation strategies

Women of Dulki village came across as very resilient to physical and mental challenges they faced when working. It seemed that women often work through their difficulties and did not have strategies to ease their stress but simply did what they believed necessary.

Women's incomes were often used to buy food supplies, particularly food to ration during heavy monsoon rainfall when women find it challenging to leave the house because of the weather conditions. Women have decision making power when it comes to family livestock rearing; produce from their livestock is also used to maintain food security in the monsoon season where it is physically challenging to leave the household. Some participants had savings for when the weather conditions are not suitable for them or their family members to work.

Families with smallholdings used their excess produce to feed their family and save for times when resources were low in the monsoon season. During the monsoon season women spawned fish in their ponds so they have fish to eat during the heavy rain periods

In the agricultural sector women have found ways to cope with the physical challenges, brought by the monsoon season. Women cover themselves in plastic to protect themselves from the rain. They also use umbrellas they attach to themselves so they can continue working in the field in heavy monsoon rainfall. Women often stated they wish to work from home to avoid weather hazards, like the heavy rainfall.

Chapter 5: Discussion

This chapter will evaluate the objectives of the study with reference to the Literature Review chapter and the Qualitative Results chapter, and bring together past findings with the study's relevant results.

5.1 Typical livelihood activities and income portfolios of women in the IBD

As established in the literature review, in the IBD the majority of women are involved in agricultural work, in the form of agricultural labour or small-holding management. This is as expected due to the biodiverse, dynamic nature of the IBD. Despite the physical challenges women face from long hours of intensive labour, women in Dulki village were willing to take part in this type of work. There were little gender disparities within the agricultural sector, reported in this study. However women faced judgements and social pressures from their community members based on their employment status.

There was a lack of opportunity for women in non-agricultural work. Often women of Dulki, had the desire to engage in small business ventures such as tailoring or opportunities further afield. It was found that women did feel they had the opportunity, time or skills to explore non-agriculture work. It was also noted that women who did not have other female company in the household lacked opportunity to leave the house to work, due to the burdens of childcare and household responsibilities.

Women had decision making power when it came to livestock rearing and personal assets such as gold and silver ornaments. Livestock was used to provide food and material for their family and often excess produce was used to sell or to ration. Women used their ornaments to 'mortgage' to generate money when their family came into financial difficulty.

Groups of women were involved in governmental loans and being a part of certain initiatives for women to access financial assistance to create a small business. During the interviews, it was revealed that women felt they had a lack of knowledge, skill and unity of group members to use this money appropriately. Therefore governmental loans were being misused and in some cases leading to further financial burden of participants.

Religious groups were found to promote women's access to employment through teaching of skills, social networking and access to materials.

5.2 How a woman's livelihood activities or income portfolio affects how they cope with monsoon season environmental and social influences

As acknowledged in the literature review, gender roles in the Indian society differ greatly between men and women. Conventionally women in India face social constraints due to traditional and conservative attitudes, particularly in rural areas. However, during interviews gender roles had evidently been somewhat redefined within the community of Dulki. Financial responsibility and attitudes toward women working independently were not as conservative and constraining as reported in the review of literature. Women were working 'for the sake of their family' and with that mentality women were not questioned. It was recognised in past literature that pressure on a household due to environmental stress can shape new social 'norms' around women working.

The women felt pressure concerning their family responsibilities. It was found that an important factor behind women's livelihood decisions is their family's wellbeing. Women would not work if their husband's income was substantial enough to support their family's needs. Financial pressure on a household led to women taking part in work outside of the household.

In the agricultural sector, both men and women worked together without discrimination against women. A form of 'collective action' was recognised Story *et al.*, (2018) where a community member is defined as 'putting aside one's own self-interest and acting on behalf of the community', through inclusion of both sexes in the agricultural workforce and moral support amongst workers. There was a sense of open mindedness regarding women taking up a working role that might be traditionally a male role. This came from the widespread understanding of financial difficulty within families across the agricultural community.

Despite reported social cohesion within the agricultural community there were social challenges between women who work and 'housewives'. Working women felt superior to women who remain in the home and women who remain in the home have been said to feel 'jealous' of women who work without recognition of the physical and mental challenges of working women. This led to a lack of unity in women's groups and could be attributed to the misuse of governmental small business loans, due to difference in opinion and lack of understanding. This lack of unity also influences opportunities brought to women through social networks. Different parts of the community were aware of different opportunities and there was not a common knowledge of available work for women.

Family unity was strong. Many women are working for the sake of their family and endure physical and mental challenges for this reason. Few women would continue to work if it was not for their husband or family's needs.

To combat heavy rainfall, women often used plastics to cover themselves whilst working through storms and heavy rainfall. Financial savings and food rations were used during periods of heavy rain and storms.

5.3 How a woman's livelihood activities and income portfolio impacts her wellbeing

Gender disparities in India in various markers of wellbeing such as, mental health, physical health and access to resources were noted in the literature review chapter. The physical health of all participants was affected by their livelihood activities. In the agricultural sector women experienced physical pain due to intensive hours and harsh conditions. Tailors and thread workers had vision issues and headaches because of long hours of concentration and detailed work. In the literature review, it was found that financial pressure leads women to take on some high risks activities. In terms of mental health and physical danger women who fished felt threatened due to fears of crocodile and tiger attacks. Attacks and deaths by crocodiles and tigers were notorious throughout the community.

Women had social stress through the opinion and judgement of other community members. However, female financial independence was conveyed to be very important by many participants who worked independently of their husbands. Older women supported their daughters to gain independence through working, for their own financial security and wellbeing and to remove financial reliance on their male counterparts. Regardless of the loosening of social 'norms' between women and men, it was evident that there are clashes in opinion within the village, and there is stigma around the idea of women who work independently.

In the literature review it was mentioned that women are not given credit in exercising agency in overcoming and withstanding physical and mental hardships. Many participants have the attitude that they will do whatever they have to, in order provide for their families and this led to a mental strain and pressure. Women displayed great reliance to hardships, such as physical and mental stress and reported that they are happy regardless of these challenges. There was a definite difference between households with sons or daughters. Mothers with daughters were worried about who they will leave their daughters with when working which reflects the difference in safety between male and females of the community.

The wish to remain in the household was well documented. This was in order to reduce issues with time keeping and pressures of household responsibility. Women found it challenging to complete their household duties and work outside of the household.

5.4 Positionality

Some gender study researchers argue that western approaches and developed countries' research strategies devalue rural women's knowledge and experience of their natural environment (Sachs, 2018). It is important to acknowledge the cultural context of any study using a gendered lens and not to make invalid assumptions taken from western culture. As stated by England, 1994 research represents a shared space, shaped by both researcher and participants: being a British woman it would be unjust to make certain assumptions of the Indian culture and society. As the researcher, I can only understand and perceive social situations and environments with the current knowledge and experience I have. Participants only divulge information they feel comfortable to, in my presence. All results in this study are a formation of empirical evidence however, my positionality must be taken into account.

5.5 Limitations

It is important to acknowledge limitations within this study to allow the reader complete transparency when interpreting the finding of this study.

Understanding the contextual differences throughout the study is essential. For example, the meaning of important terms such as 'happiness' is contextual, different in different aspects of this research paper. Firstly there will be contextual differences between the quantitative and qualitative aspects of this study. Assumptions that the quantitative findings can apply to the qualitative findings should not be made.

Since all participants spoke Bengali all interviews went through a translation process where the questions were translated prior to the data collection and the answers translated post data collection. It cannot be certain that terms and phrases were perceived in the same context by both the interviewer and the participant.

Dulki was chosen as a case study of a rural community within the Sundarban region. However any findings related to this study cannot be assumed to be common throughout the Sundarban region.

Chapter 6: Conclusion

The overall aim of this research was to **explore the role of livelihood activities and income portfolios in shaping women's perception of wellbeing and adaptation choices.**

The specific research objectives were:

1. To document the typical livelihood activities and income portfolios of women in the IBD
2. Does a woman's livelihood activities or income portfolio affect how they cope with environmental and social influences
3. How does a woman's livelihood activities and income portfolio impact her wellbeing?

This section will revisit the research objectives above, summarise the findings of this research work and comprise conclusions based on the findings.

The typical livelihood activities of women in the IBD were within the agricultural sector. There was a lack of opportunity for women in non-agricultural work. This was associated with a wide variety of obligations that women had of household and family responsibilities, which imposed pressure on women to remain in/near the household. Women used assets such as livestock and ornaments to improve financial security.

Opportunity arose from governmental initiatives and religious groups. Groups of women were involved in governmental loans and initiatives for women to access financial assistance to create a small business. The misuse of these loans sometimes led to further financial stress and was attributed to lack of skills, assurance and unity of women's groups. It would be useful for women to receive the loans alongside skill training programmes that teach women *how* to use governmental loans.

All women had a wide variety of past and present livelihood activities and income portfolios, relevant to their skill set, family's needs and access to opportunity.

The redefinition of gender roles was apparent in certain parts of the community of Dulki. This was due to financial pressures on a household where the males of the household could not sustain the financial wellbeing of a family. This led to increased acceptance of women taking up independent work. Women worked amply for 'the sake of their family', disregarding their personal wellbeing and health.

Women had huge pressures to provide for their family, in childcare and household responsibilities which in turn affected their livelihood choices. There was social cohesion within the agricultural

sector where men and women worked well together. However, there were inconsistencies in the social networking of women in the community where working women and unemployed women lacked understanding of one another. This in turn influenced the opportunity for women to assist one another in venturing into a small business and could be attributed to the misuse of governmental loans for small business.

Overall, rural women in the IBD proved to be resilient to environmental and social pressures, and with good social networks coped well with external challenges.

The health of all participants was affected by their livelihood activities. The physical health of women in the IBD was being affected due to intensive working hours and the harsh nature of certain livelihood activities. In terms of mental health, women in the study were laden with a magnitude of responsibilities and obligations that often caused predicaments when making decisions regarding their livelihoods.

Women had social challenges like the opinion and judgement of other community members, when choosing to work independently. However, with strong family unity and the desire to maintain their family's wellbeing most of these issues were set aside. Women display great resilience to hardships that they experience, such as physical and mental stress, yet there is still stigma surrounding women who work.

6.1 Recommendations

Recommendations for future studies will be discussed, in terms of how to progress further in this area of research.

The data synthesised in this study is valuable to the academic community of gender and environmental studies. It is a fast growing field. There is a need for a better understanding of women's perceptions and wellbeing in relation to their social networks and environmental influences. I think that it would be valuable to develop studies that focus on women's perception on their social networks and how Indian culture influences them.

This study brought to the forefront the need to understand not only interactions between women and their social networks; their family and community, but also the relationships these social networks have with their decision making. Relatively little is known about the impacts of environmental and social pressure on non-agricultural incomes. Therefore, in the future it would be useful for non- agricultural incomes of women in India to be explored, in context of environmental and social change.

The findings of this study reinforce that access to education, employment and a change in social structure are the most important factors in working towards improving the lives of rural women. The Indian government should invest in building women's skillsets and encouraging young women to remain in education. This would equip women to have a better chance of working independently and increase employment opportunities. This highlights the importance of inclusive rural development policies that considers the lives of men women and children.

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Appendices

Appendix 1: Participant Consent

CONSENT FORM

Study title: The role of livelihood activities and income portfolios in shaping women's perceptions of wellbeing and adaptation choices, in the Indian Bengal Delta

Researcher name: Rosalyn Lloyd Haynes

ERGO number: 41190

Please initial the box(es) if you agree with the statement(s):

I have been explained the purpose of this interview and have had the opportunity to ask questions about the study	
I agree to take part in this research project and agree for my data to be used for the purpose of this study.	
I understand my participation is voluntary and I may withdraw (at any time) for any reason without my rights being affected.	

I understand that I will be audio recorded during this interview	

Name of participant (print name/
thumbprint).....

Signature of participant.....

Date.....

Name of researcher (print name).....

Signature of researcher

Date.....

Appendix 2: Participant Debrief Form



The role of occupation type in empowering women in the Indian Bengal Delta

Debriefing Statement (Version 1, 21/05/18)

The aim of this research was to explore the role of livelihood activities and income portfolios in shaping women's perceptions of wellbeing and adaptation choices, in the Indian Bengal Delta. Your data will help our understanding of the role of livelihood activities and income portfolios in shaping women's perceptions of wellbeing and adaptation choices. Once again results of this study will not include your name or any other identifying characteristics. The research did not use deception. You may have a copy of this summary and the findings of the study if you wish.

If you have any further questions, please contact me Rosalyn Lloyd Haynes at The University of Southampton, UK rlh1g13@soton.ac.uk or Tuin Ghosh at Jadavpur University, tuhin_ghosh@yahoo.com.

Thank you for your participation in this research.

Signature _____ Date _____

Name _____

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the Chair of the Ethics Committee, Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: +44 (0)23 8059 3856, email fshs-rso@soton.ac.uk

Appendix 3: Participant Information Sheet

Participant Information Sheet

Study Title: The role of livelihood activities and income portfolios in shaping women's perceptions of wellbeing and adaptation choices, in the Indian Bengal Delta

Researcher: Rosalyn Lloyd Haynes

ERGO number: 41190

Please read this information carefully before deciding to take part in this research. It is up to you to decide whether or not to take part. If you are happy to participate you will be asked to sign a consent form.

What is the research about?

This study is contributing to my Masters (MSc sustainability). I am a student from the University of Southampton working in partnership with Jadavpur University. I am interested in women's perception in rural areas. I am interested in answering the following questions:

1. What are typical livelihood activities and income portfolios?
2. Do livelihood activities and income portfolios impact the wellbeing and life satisfaction of women?
3. Do livelihood activities and income portfolios impact adaptation choices made by women?

This study is funded by CASCO and in association with Jadavpur University.

Why have I been asked to participate?

You have been asked to participate as you are a woman living in a rural area.

What will happen to me if I take part?

If you agree to take part, you will be asked 6 questions by a translator. The interview will last between 30 – 50 minutes. However, you can end the interview at any given time. You will be asked questions about your income and livelihood questions. If consent is given you will be audio recorded but this is not compulsory to take part. The interview will in a single visit from the researcher.

Are there any benefits in my taking part?

No. However, you will be assisting a student in their research. I would be grateful for your time.

Are there any risks involved?

There is minimal risk in participating in this study, that are different to risks encountered in everyday life. Topics discussed in the interview may cause some distress, such as difficult experiences or memories. However, if the participant feels and distress they are able to stop or pause the interview at any given time.

Will my participation be confidential?

All interviews will be transcribed and anonymously coded after data collection. All data will then be destroyed. Names or identifying characteristics will not be used. The research will comply with the UK Data Protection Act and The University of Southampton Research Data Management Policy. Anonymity – the signed consent forms will be kept separate from the interview transcripts, in the write-up pseudonyms will be used, and no identifying characteristics of the individual or household will be written up. Confidentiality - transcripts and consent forms, will be kept in a locked suitcase while in the field, and once transcribed, the data on the computer will be kept in a password protected file. During the data collection period, fieldnotes will be stored in a secure place. Fieldnotes will be destroyed after transcription of interviews. Processed data will be stored digitally under a secure password. Processed data will be permanently deleted after the study is complete. Only the researcher and their project coordinator will have access to the data at any time.

What should I do if I want to take part?

To take part please complete a consent form and inform the researcher of your interest in the study.

What happens if I change my mind?

Participants have the right to withdraw at any time in the interview. If a participant withdraws within the interview time, all data will be destroyed.

What will happen to the results of the research?

The results of this research will be documented in a dissertation project and is unlikely to be published. A copy of the results can be obtained by the participant by contacting the researcher, if required (see contact details on debrief form). Research data will be stored until the end of the study (September 2018) and the data will not be made available for future studies. If you wish to gain a copy of the final research project a copy will be held at Jadavpur University with Tuin Ghosh.

Where can I get more information?

If you require more information on the study, please contact

Tuin Ghosh, Jadavpur University.

Or

Emma Tompkins, University of Southampton.

Email: E.L.Tompkins@soton.ac.uk

What happens if something goes wrong?

In the unlikely case of concern or complaint, please contact the Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk) or **Tuin Ghosh**, Jadavpur University, tuhin_ghosh@yahoo.com.

Thank you.

Appendix 4: Interview Schedule

Interview schedule

Researcher Name: Rosalyn Lloyd Haynes

Introduction – *Participants will be greeted; the purpose of the study will be explained using the participant information sheet, and consent will be gained using the consent form. (see attached forms)*

Question 1

What activities do you carry out to gain an income?

Avoid talking about

- **Remind them that livelihoods are any activities that generate money or income support**

Prompt to talk about

- **Women of the household**
- **Work inside and outside of the home**

Question 2

How do these activities make you feel?

Avoid talking about

- **N/A**

Prompt to talk about

- **How income/ livelihood activities relate to emotions, difficulties, well-being, happiness**

Question 3

Do you feel that these activities help you cope with the monsoon season?

Avoid talking about

- **Environmental change**

Prompt to talk about

- **Decisions**
- **Feelings**
- **Social challenges faced**

Question 4

What incomes/livelihood activities are least affected by the monsoons, in the village?

Avoid talking about

- **N/A**

Prompt to talk about

- **Women of the community**

- Women's work

Question 5

Do you think women who work cope better with the impacts of monsoon season?

Avoid talking about

- the environmental impacts of the monsoon

Prompt to talk about

- How working leads women to protect their homes, their health, their children differently

Question 6

What is your view of women owning their own businesses?

Avoid talking about

- N/A

Prompt to talk about

- encourage both positive and negative views
- Ask for reasons behind views

Debrief – The participant will be thanked for their time and given a debrief form to allow them to follow up on the study results, if required. (see form attached)

Appendix 5: Frequency Tables from DECCMA household survey

Material Wellbeing

Which household member goes without food first?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female adult	1319	87.9	98.4	98.4
	Male adult	13	.9	1.0	99.3
	Other	2	.1	.1	99.5
	Don't know	7	.5	.5	100.0
	Total	1341	89.4	100.0	
Missing	System	159	10.6		
Total		1500	100.0		

- Q2_3_2

Who decides? - Spending family savings?

	Frequency	Percent	Valid Percent	Cumulative Percent
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Valid	Adult male only	371	24.7	27.6	27.6
	Both male and female adults	781	52.1	58.2	85.8
	Female adult only	184	12.3	13.7	99.6
	Other	1	.1	.1	99.6
	Not applicable	5	.3	.4	100.0
	Total	1342	89.5	100.0	
Missing	System	158	10.5		
Total		1500	100.0		

- Q2_5_1B

Who decides? - Taking out a loan?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Adult male only	414	27.6	30.8	30.8
	Both male and female adults	762	50.8	56.8	87.6
	Female adult only	149	9.9	11.1	98.7
	Other	1	.1	.1	98.8
	Not applicable	16	1.1	1.2	100.0
	Total	1342	89.5	100.0	
Missing	System	158	10.5		
Total		1500	100.0		

- Q2_5_1C

Who decides? - Taking up work outside the home?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Adult male only	617	41.1	46.0	46.0
	Both male and female adults	595	39.7	44.3	90.3
	Female adult only	102	6.8	7.6	97.9
	Other	1	.1	.1	98.0
	Not applicable	27	1.8	2.0	100.0
	Total	1342	89.5	100.0	
Missing	System	158	10.5		
Total		1500	100.0		

- Q2_5_1E

Who decides? - Education of children?

		Frequency	Percent	Valid Percent	Cumulative Percent
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Valid	Adult male only	98	6.5	7.3	7.3
	Both male and female adults	835	55.7	62.2	69.5
	Female adult only	240	16.0	17.9	87.4
	Other	1	.1	.1	87.5
	Not applicable	168	11.2	12.5	100.0
	Total	1342	89.5	100.0	
Missing	System	158	10.5		
Total		1500	100.0		

- Q2_5_1G

Subjective Wellbeing

How happy are you with your life in general? * Type of household: Male or Female household head Crosstabulation

			Type of household: Male or Female household head		Total
			Male	Female	
How happy are you with your life in general?	Very happy	Count	184	29	213
		% within Type of household: Male or Female household head	16.4%	14.9%	16.2%
	Moderately happy	Count	733	113	846
		% within Type of household: Male or Female household head	65.4%	57.9%	64.3%
		Count	63	15	78

	Neither happy/unhappy	% within Type of household: Male or Female household head	5.6%	7.7%	5.9%
	Moderately unhappy	Count	99	24	123
		% within Type of household: Male or Female household head	8.8%	12.3%	9.4%
	Very unhappy	Count	41	14	55
		% within Type of household: Male or Female household head	3.7%	7.2%	4.2%
	Total	Count	1120	195	1315
		% within Type of household: Male or Female household head	100.0%	100.0%	100.0%

- Q3b_1_1

Life satisfaction - Economic security * Type of household: Male or Female household head Crosstabulation

			Type of household: Male or Female household head		
			Male	Female	Total
Life satisfaction - Economic security	Very happy	Count	143	14	157
		% within Type of household: Male or Female household head	12.8%	7.2%	11.9%
	Moderately happy	Count	508	90	598
		% within Type of household: Male or Female household head	45.4%	46.2%	45.5%
		Count	133	22	155

	Neither happy/unhappy	% within Type of household: Male or Female household head	11.9%	11.3%	11.8%
		Count	250	44	294
	Moderately unhappy	% within Type of household: Male or Female household head	22.3%	22.6%	22.4%
		Count	86	25	111
	Very unhappy	% within Type of household: Male or Female household head	7.7%	12.8%	8.4%
		Count	1120	195	1315
Total		% within Type of household: Male or Female household head	100.0%	100.0%	100.0%
		Count			

- Q3b_1_2B

Life satisfaction - Interactions with family * Type of household: Male or Female household head Crosstabulation

			Type of household: Male or Female household head		Total
			Male	Female	
Life satisfaction - Interactions with family	Very happy	Count	825	126	951
		% within Type of household: Male or Female household head	73.7%	64.6%	72.3%
	Moderately happy	Count	271	55	326
		% within Type of household: Male or Female household head	24.2%	28.2%	24.8%
		Count	7	5	12
		% within Type of household: Male or Female household head			

	Neither happy/unhappy	% within Type of household: Male or Female household head	0.6%	2.6%	0.9%
	Moderately unhappy	Count	9	2	11
		% within Type of household: Male or Female household head	0.8%	1.0%	0.8%
	Very unhappy	Count	8	7	15
		% within Type of household: Male or Female household head	0.7%	3.6%	1.1%
	Total	Count	1120	195	1315
% within Type of household: Male or Female household head		100.0%	100.0%	100.0%	
• Q3_1_2G					

Life satisfaction - Interactions with the community * Type of household: Male or Female household head Crosstabulation

			Type of household: Male or Female household head		
			Male	Female	Total
Life satisfaction - Interactions with the community	Very happy	Count	583	81	664
		% within Type of household: Male or Female household head	52.1%	41.5%	50.5%
	Moderately happy	Count	447	92	539
		% within Type of household: Male or Female household head	39.9%	47.2%	41.0%
	Neither happy/unhappy	Count	31	8	39
		% within Type of household: Male or Female household head	2.8%	4.1%	3.0%
	Count	44	7	51	

	Moderately unhappy	% within Type of household: Male or Female household head	3.9%	3.6%	3.9%
	Very unhappy	Count	15	7	22
		% within Type of household: Male or Female household head	1.3%	3.6%	1.7%
Total	Count		1120	195	1315
	% within Type of household: Male or Female household head		100.0%	100.0%	100.0%

- Q3_1_2H

Personality

Personality - I am relaxed and handle stress well (PN) * Type of household: Male or Female household head Crosstabulation

			Type of household: Male or Female household head		Total
			Male	Female	
Personality - I am relaxed and handle stress well (PN)	Disagree strongly	Count	121	24	145
		% within Type of household: Male or Female household head	10.8%	12.3%	11.0%
	Disagree a little	Count	201	48	249
		% within Type of household: Male or Female household head	17.9%	24.6%	18.9%
	Neither agree nor disagree	Count	5	1	6
		% within Type of household: Male or Female household head	0.4%	0.5%	0.5%
	Agree a little	Count	405	70	475

	Agree strongly	% within Type of household: Male or Female household head	36.2%	35.9%	36.1%
		Count	388	52	440
		% within Type of household: Male or Female household head	34.6%	26.7%	33.5%
Total		Count	1120	195	1315
		% within Type of household: Male or Female household head	100.0%	100.0%	100.0%

- Q3B_2_1D

Personality - I am open to new experiences (PO) * Type of household: Male or Female household head Crosstabulation

			Type of household: Male or Female household head		Total
			Male	Female	
Personality - I am open to new experiences (PO)	Disagree strongly	Count	29	20	49
		% within Type of household: Male or Female household head	2.6%	10.3%	3.7%
	Disagree a little	Count	62	14	76
		% within Type of household: Male or Female household head	5.5%	7.2%	5.8%
	Neither agree nor disagree	Count	14	4	18
		% within Type of household: Male or Female household head	1.3%	2.1%	1.4%
	Agree a little	Count	394	65	459
		% within Type of household: Male or Female household head	35.2%	33.3%	34.9%
	Agree strongly	Count	621	92	713
		% within Type of household: Male or Female household head			

	% within Type of household: Male or Female household head	55.4%	47.2%	54.2%
Total	Count	1120	195	1315
	% within Type of household: Male or Female household head	100.0%	100.0%	100.0%

- Q3B_2_1E

**Personality - I like looking for better ways of doing things (SE) * Type of household:
Male or Female household head Crosstabulation**

			Type of household: Male or Female household head		
			Male	Female	Total
Personality - I like looking for better ways of doing things (SE)	Disagree strongly	Count	24	14	38
		% within Type of household: Male or Female household head	2.1%	7.2%	2.9%
	Disagree a little	Count	43	7	50
		% within Type of household: Male or Female household head	3.8%	3.6%	3.8%
	Neither agree nor disagree	Count	1	5	6
		% within Type of household: Male or Female household head	0.1%	2.6%	0.5%
	Agree a little	Count	333	58	391
		% within Type of household: Male or Female household head	29.7%	29.7%	29.7%
	Agree strongly	Count	719	111	830
		% within Type of household: Male or Female household head	64.3%	56.4%	64.3%

	% within Type of household: Male or Female household head	64.2%	56.9%	63.1%
Total	Count	1120	195	1315
	% within Type of household: Male or Female household head	100.0%	100.0%	100.0%

- Q3B_2_1F

Personality - I feel comfortable making big decisions (RA) * Type of household: Male or Female household head Crosstabulation

			Type of household: Male or Female household head		
			Male	Female	Total
Personality - I feel comfortable making big decisions (RA)	Disagree strongly	Count	122	22	144
		% within Type of household: Male or Female household head	10.9%	11.3%	11.0%
	Disagree a little	Count	173	29	202
		% within Type of household: Male or Female household head	15.4%	14.9%	15.4%
	Neither agree nor disagree	Count	8	1	9
		% within Type of household: Male or Female household head	0.7%	0.5%	0.7%
	Agree a little	Count	361	59	420
		% within Type of household: Male or Female household head	32.2%	30.3%	31.9%
	Agree strongly	Count	456	84	540
		% within Type of household: Male or Female household head			

	% within Type of household: Male or Female household head	40.7%	43.1%	41.1%
Total	Count	1120	195	1315
	% within Type of household: Male or Female household head	100.0%	100.0%	100.0%

- Q3B_2_1G

Place Attachment and Social Networks

Place Attachment & social networks - My friends and family are good support (SC) *

Type of household: Male or Female household head Crosstabulation

			Type of household: Male or Female household head		
			Male	Female	Total
Place Attachment & social networks - My friends and family are good support (SC)	Disagree strongly	Count	15	2	17
		% within Type of household: Male or Female household head	1.3%	1.0%	1.3%
	Disagree a little	Count	37	8	45
		% within Type of household: Male or Female household head	3.3%	4.1%	3.4%
	Neither agree nor disagree	Count	1	2	3
		% within Type of household: Male or Female household head	0.1%	1.0%	0.2%
	Agree a little	Count	402	63	465
		% within Type of household: Male or Female household head	35.9%	32.3%	35.4%

	Agree strongly	Count	665	120	785
		% within Type of household: Male or Female household head	59.4%	61.5%	59.7%
Total		Count	1120	195	1315
		% within Type of household: Male or Female household head	100.0%	100.0%	100.0%

- Q3b_3_1F

Appendix 6: Secondary data ethics form

Version May 2016

Ethics Application Form for SECONDARY DATA ANALYSIS

Please consult the guidance at the end of this form before completing and submitting your application.

- Name(s):** Rosalyn Lloyd Haynes
- Current Position:** Postgraduate student (MSc Sustainability)
- Contact Details:**
Division: Geography and the Environment
Email: rlh1g13@soton.ac.uk
Phone: 07521129966
- Is your research being conducted as part of an education qualification?**
Yes ☒ No ☐
- If Yes, please give the name of your supervisor:**
Emma Tompkins
- Title of your research project / study:**

The role of livelihood activities and income portfolios in shaping women's perceptions of wellbeing and adaptation choices, in the Indian Bengal Delta

7. Briefly describe the rationale, aims, design and research questions of your research

Please indicate clearly whether you are applying for ethics approval for a specific piece of research, or for overarching ethics approval to use certain datasets for a range of research activities. Approval for the latter will only cover the datasets specified here, for a maximum of 3 years and then subject to renewal.

The aim of this study is to explore the role of livelihood activities and income portfolios in shaping women's perceptions of wellbeing and adaptation choices, in the Indian Bengal Delta

The research questions that will be answered in this study are

1. What are typical livelihood activities and income portfolios?
2. Do livelihood activities and income portfolios impact the wellbeing and life satisfaction of women?

Do livelihood activities and income portfolios impact adaptation choices made by women?

8. Describe the data you wish to analyse

Please give details of the title of the dataset, nature of data subjects (e.g. individuals or organisations), thematic focus and country/countries covered. Indicate whether the data are qualitative or quantitative, survey data, administrative data or other types of data. Identify the source from where you will be obtaining the data (including a web address where appropriate).

The Qualitative research methods will be conducting interviews in the Indian Bengal delta, in the villages Mathurakhanda and Dulki. These villages are situated in the Gosba, South 24 Parganas District. Data collection will occur between the 4/6/28-12/6/18. Interviews will be conducted using a translator. Interviews will be between 20 - 50 minutes per participant, 6 semi structured questions will be asked per interview.

The use of secondary data will be a Quantitative research method that will involve statistical analysis of a household questionnaire data set collected by DECCMA in a previous study.

9. What are the terms and conditions around the use of the data? Did data subjects give consent for their data to be re-used? If not, on what basis is re-use of the data justified?

Please state what (if any) conditions the data archive imposes (e.g. registration, signing of confidentiality agreement, specific training etc.). In many cases the data controller will have given explicit permission for data re-use. Please explain how you justify the use of data if approval and consents for the original data collection and re-use are not in place. This may

be the case where, for example, the original data collection predated requirements for ethics review or occurred in a jurisdiction where explicit consent and approval are not required.

The DECMMA project received ethics approval (ERGO number 18173) for this study that allowed for data to be used in future research.

10. Do you intend to use personal data

(https://ico.org.uk/media/1549/determining_what_is_personal_data_quick_reference_guide.pdf) or sensitive personal data (<http://www.legislation.gov.uk/ukpga/1998/29/section/2>) as defined by the Data Protection Act (even if the data are publicly available)?

Yes ☐ No ☒

If YES, please specify what personal data will be included and why.

11. Do you intend to link two or more datasets?

Data linkage refers to merging of information from two or more sources of data to consolidate facts concerning an individual or an event that are not available in any separate record. Please note that for the purposes of research ethics we are not interested in the merging of different waves of a particular survey, or the merging of data from different countries for the same survey.

Yes ☐ No ☒

If YES, please give details of which datasets will be linked and for what purposes.

12. How will you store and manage the data before and during the analysis? What will happen with the data at the end of the project?

Please consult the University of Southampton's Research Data Management Policy (<http://library.soton.ac.uk/researchdata/storage> and <http://www.calendar.soton.ac.uk/sectionIV/research-data-management.html>), and indicate how you will abide by it.

The data will be stored on a password-controlled USB and locked in a safe when not in use during fieldwork. The data will be permanently deleted after the project is over.

13. How will you minimise the risk that data subjects (individuals or organisations) could be identified in your presentation of results?

Please consider whether disclosive ID codes have been used (e.g. date of birth) and whether it is theoretically possible to identify individuals by combining characteristics (e.g. widow in

Hampshire with 14 children) or by combining datasets. How will you protect individuals' anonymity in your analysis and dissemination?

All data will be anonymised in the presentation of results and characteristics that could reveal a participant's identity will not be discussed.

14. What other ethical risks are raised by your research, and how do you intend to manage these?

Issues may arise due to the nature of the research you intend to undertake and/or the subject matter of the data. Examples include: data or analysis that are culturally or socially sensitive; data relating to criminal activity, including terrorism, and security sensitive issues.

The data will not include culturally, or socially sensitive aspects and all data will be anonymised in the presentation of results and characteristics that could reveal a participant's identity will not be discussed

15. Please outline any other information that you feel may be relevant to this submission.

For example, will you be using the services or facilities of ONS, ADRN, or HSCIC and/or are you obtaining ethical review from NRES (through IRAS) or other? Please confirm whether the data being used are already in the public domain.

SSEGM ethics form will be used to obtain ethical approval for the primary data collection in this study.

16. Please indicate if you, your supervisor or a member of the study team/research group are a data controller and/or data processor in relation to the data you intend to use as defined by the Data Protection Act, and confirm that you/they understand your/their respective responsibilities <https://ico.org.uk/for-organisations/guide-to-data-protection/key-definitions/>).

I am not a data controller nor a data processor. Data processing has already been done by the DECCMA project team, within the remit of DECCMA ethics application 18173. The data are controlled by the DECCMA project team, and permission needs to be gained from them to use the data set – this has been granted to you. Further, the DECCMA project team have explained that:

- I must ensure that all participants have their anonymity guaranteed, and that no identifying characteristics (including, but not limited to: names, locations, phone contacts) can be used in any research outputs,
- that pseudonyms must be used in presentation of data,
- that the data set needs to be stored in a password-controlled file that only I have access to, and kept on only 1 personal electronic medium that is password protected
- that the dataset needs to be permanently deleted from my laptop once I have completed my analysis.

Note: This Ethics Application Form is currently being piloted. If you have comments on any of the questions, it would be helpful if you could email them to rgoinfo@soton.ac.uk with “Secondary Data Analysis Form” in the subject line.

Appendix 7: SSEGM Ethics form

This version updated December 2013

SSEGM ETHICS SUB-COMMITTEE APPLICATION FORM

Please note:

- **You must not begin data collection for your study until ethical approval has been obtained.**
- **It is your responsibility to follow the University of Southampton’s Ethics Policy and any relevant academic or professional guidelines in the conduct of your study. This includes providing appropriate information sheets and consent forms and ensuring confidentiality in the storage and use of data.**
- **It is also your responsibility to provide full and accurate information in completing this form.**

1. **Name(s):** Rosalyn Lloyd Haynes

2. **Current Position** Postgraduate Student (MSc Sustainability)

3. **Contact Details:**

Division/School Geography and the Environment

Email rlh1g13@soton.ac.uk

Phone 07521129966

4. **Is your study being conducted as part of an education qualification?**

Yes ☒ No ☐

5. **If Yes, please give the name of your supervisor**

Emma Tompkins

6. Title of your project:

The role of livelihood activities and income portfolios in shaping women's perceptions of wellbeing and adaptation choices, in the Indian Bengal Delta

7. Briefly describe the rationale, study aims and the relevant research questions of your study

The aim of this study is to explore the role of livelihood activities and income portfolios in shaping women's perceptions of wellbeing and adaptation choices, in the Indian Bengal Delta

The research questions that will be answered in this study are

3. What are typical livelihood activities and income portfolios?
4. Do livelihood activities and income portfolios impact the wellbeing and life satisfaction of women?
5. Do livelihood activities and income portfolios impact adaptation choices made by women?

8. Describe the design of your study

The Qualitative research methods will be conducting interviews in the Indian Bengal delta, in the villages Mathurakhanda and Dulki. These villages are situated in the Gosba, South 24 Parganas District. Data collection will occur between the 4/6/28-12/6/18. Interviews will be conducted using a translator. Interviews will be between 20 - 50 minutes per participant, 6 semi structured questions will be asked per interview.

The Quantitative research method will involve statistical analysis of a household questionnaire data set collected by DECCMA in a previous study.

9. Who are the research participants?

Participants will be Women from the households in the villages Mathurakhanda and Dulki. Participants will be over 18 years old. Participants will be mentally, and physically stable and no socially vulnerable individuals will be involved in this study.

10. If you are going to analyse secondary data, from where are you obtaining it?

The Quantitative research method will involve statistical analysis of a household questionnaire data set collected by DECCMA in a previous study.

11. If you are collecting primary data, how will you identify and approach the participants to recruit them to your study?

Please upload a copy of the information sheet if you are using one – or if you are not using one please explain why.

Jadavpur University (JU) will identify the villages, as they have undertaken a census of the people in these villages. I will use their census data to identify households with women with a range of livelihood activities. The specific households will be decided once in India. People will be recruited through translators working for JU, a translator and I will approach each household and ask of the women in the household are willing to be interviewed. I will show them a copy of the participant information sheet, which the JU translator will read to them, the JU translator will then ask them to sign a consent form if they are happy to participate.

12. Will participants be taking part in your study without their knowledge and consent at the time (e.g. covert observation of people)? If yes, please explain why this is necessary.

No.

13. If you answered 'no' to question 12, how will you obtain the consent of participants?

Please upload a copy of the consent form if you are using one – or if you are not using one please explain why.

Participants will be made fully aware of the study and be given a participant information sheet and consent form before they agree to be a part of the study (see attached).

14. Is there any reason to believe participants may not be able to give full informed consent? If yes, what steps do you propose to take to safeguard their interests?

No, a translator will be used along with the participant information sheet and consent form. Participants will fully informed. An ink pad will be used to gain a thumbprint of the participant if they cannot write.

- 15. If participants are under the responsibility or care of others (such as parents/carers, teachers or medical staff) what plans do you have to obtain permission to approach the participants to take part in the study?**

There will be no participants involved who are under the responsibility or care of others

- 16. Describe what participation in your study will involve for study participants. Please attach copies of any questionnaires and/or interview schedules and/or observation topic list to be used**

Interviews will be conducted using a translator. Interviews will be between 20 - 50 minutes per participant, 6 semi structured questions will be asked per interview. The interviews will be recorded using voice recorders. Participants will be asked explicitly in the consent form if this is acceptable to them. See attached interview schedule.

- 17. How will you make it clear to participants that they may withdraw consent to participate at any point during the research without penalty?**

This will be made clear on the participant information sheet received by participants before they agree to take part in the study.

- 18. Detail any possible distress, discomfort, inconvenience or other adverse effects the participants may experience, including after the study, and you will deal with this.**

There is a small risk of participants experiencing feelings of distress during/ after the interview. This could be due to discussing sensitive issues that surround the interview topic such as life histories of participants. I will deal with this by giving the participant an option to withdraw from the interview at any given time and also being aware of their body language during the interview. If the participant shows any signs of distress the interview will be paused immediately, and the individual will be asked if they wish to continue.

19. How will you maintain participant anonymity and confidentiality in collecting, analysing and writing up your data?

All interviews will be transcribed and anonymously coded after data collection. All data will then be destroyed. Names or identifying characteristics will not be used. Anonymity – the signed consent forms will be kept separate from the interview transcripts, in the write-up pseudonyms will be used, and no identifying characteristics of the individual or household will be written up. Confidentiality - transcripts and consent forms, will be kept in a locked suitcase while in the field, and once transcribed, the data on the computer will be kept in a password protected file.

20. How will you store your data securely during and after the study?

The University of Southampton has a Research Data Management Policy, including for data retention. The Policy can be consulted at <http://www.calendar.soton.ac.uk/sectionIV/research-data-management.html>

During the data collection period, fieldnotes will be stored in a locked suitcase for the data whilst in the field. Audio data will be stored on a password secured USB stick and will be permanently deleted after the fieldwork. Fieldnotes will be destroyed after transcription of interviews. Processed data will be stored digitally under a secure password. Processed data will be permanently deleted after the study is complete.

21. Describe any plans you have for feeding back the findings of the study to participants.

Contact information will be provided on the debrief form (see attached) so participants can follow up and gain feedback for any findings, if required.

22. What are the main ethical issues raised by your research and how do you intend to manage these?

Obtaining consent through translators.

Maintaining anonymity and confidentiality.

Approaching possibly sensitive topics within interviews.

23. Please outline any other information you feel may be relevant to this submission.

All forms mentioned above are attached to this submission.

Appendix 8: ERGO risk assessment form

Risk Assessment Form for Assessing Ethical and Research Risks

- Please see Guidance Notes at the end of this document.
- *Students:* Please make sure you have discussed this form with your supervisor!

Researcher's name:	Rosalyn Lloyd Haynes
<i>In case of students:</i>	
Supervisor's name:	Professor Emma Tompkins
Degree course:	MSc Sustainability

Part 1 – Research activities

What do you intend to do? *(Please provide a brief description of your study and details of your proposed methods.)*

The aim of this study is to explore the role of livelihood activities and income portfolios in shaping women's perceptions of wellbeing and adaptation choices, in the Indian Bengal Delta. A quantitative analysis on previous survey data carried out by DECMMA (ERGO ID 18173) for the Indian Bengal Delta, will be used. Statistical analysis of this data will lead to informing the researcher of gaps in the data. The trip to Kolkata will allow the researcher to conduct interviews with women to explore the role of livelihood activities and income portfolios in shaping women's perceptions of wellbeing and adaptation choice. The researcher will travel to rural villages located within the Sundarbans to conduct interviews. The research participants will be comprised women from different livelihood activities and income portfolios, with the sample size being approximately 30 participants purposively sampled. The fieldwork research will be conducted on the 4th-12th of June, in order to avoid researching during the monsoon season. All of the participants that will be interviewed will be over the age of 18, and not socially vulnerable therefore able to consent or deny involvement in the study when given a participation information sheet.

Will your research involve collection of information from other people? *(If yes, please provide a description of your proposed sample.)*

Yes, the research will collect data from women located in the Indian Bengal Delta. Semi-structured interviewing will be used as the qualitative data method. Interview participants will be sampled from the DECCMA survey dataset. Purposive sampling will be used to select women from the survey who are representative of the characteristics required, such as women who own their own businesses or work in /out of the household. Overall, approximately 30 participants are expected to be interviewed in two villages (Mathurakhanda village and Dulki village).

If relevant, what locations are involved? *(Please specify which country/region/place you will be working in, and details of where data collection activities will take place (e.g. public or private space).)*

The Qualitative research methods will be conducting interviews in the Indian Bengal delta, in the villages Mathurakhanda and Dulki. These villages are situated in the Gosba, South 24 Parganas District.

Will you be working alone or with others in the data collection process?

A team of research students from the University of Southampton will be collecting data alongside this project. We will also be working in partnership with masters students from Jadavpur University, Kolkata. These university students will act as translators during the research interviews.

Part 2 – Potential risks to YOU as the researcher

Please specify potential safety issues arising from your proposed research activity. (*Give consideration to aspects such as lone working, risky locations, risks associated with travel; please assess the likelihood and severity of risks.*) *If you have already completed a departmental H&S risk assessment, this may be attached to cover these aspects.*

- **Travelling:** Traffic in India is often busy within cities and travel safety is often of lower quality than the UK. Also, car safety specifications may be out of date. **H Risk: Medium risk.**
- **Health:** Cholera, malaria, Japanese encephalitis, rabies, diarrhoea, food poisoning and dehydration are a risk. **Risk: Medium risk.**
- **Terrorist/local conflicts:** National issues/ conflicts between different religious groups, and the possibility of terrorist attacks are a risk. **Risk: Low Risk.**
- **Animals or insects:** in specifically the rural study areas, there is a higher prevalence of potentially dangerous animals. Receiving a bite and not receiving the correct treatment in a timely manner could result in severe illness. **Risk: Low Risk.**
- **Weather conditions:** During the study it will be the beginning of the monsoon season, this could mean flooding within the study area. It is also cyclone season during this time of year and the delta is at risk of being hit. Another risk will be the temperature of this region at this time of year. Temperature could. Reach up to 50 degrees centigrade. **Risk: Medium Risk.**
- **Lone working:** As this is a foreign environment to the researcher there is a risk to potentially getting lost, being vulnerable to local crime in the area and being unable to communicate with locals. **Risk: Low risk.**

What precautions will you take to minimise these risks?

- I will travel in a vehicle that has seat belts and use drivers that are known or recommended by Jadavpur University staff. I will also take care when travelling by foot and other local modes of transport.
- To maintain good health, I will only drink from bottled water during the trip. I will only eat in trusted restaurants, or the restaurants where my guides from Jadavpur University recommend. I will not eat any food that could possibly be contaminated such as dairy products or uncooked washed leaves/ vegetables. Recommended vaccinations will be obtained before travelling to India. Personal hygiene will be kept to a high standard throughout the trip.
- Before travelling to India, I will research the foreign and commonwealth offices advice on the area I will travel to and follow recommendations. I will make sure I am aware of the location of the UK embassy in case of an emergency and emergency numbers in India (Address and phone number of the British consulate in Kolkata – British Deputy High Commission Kolkata, 1A Ho Chi Minh Sarani, Kolkata 700071, India. Email web.newdelhi@fco.gov.uk Phone +91 (33) 2288 5172/2288 5173-76. Fax +91 (33) 2288 3435) (India emergency numbers – 100(police) 102(ambulance) 101(fire) 108(disaster) .
- I will wear sensible and culturally sensitive clothing in the field for protection against any snake bites and other environmental hazards and to respect local culture.
- The weather forecast will be monitored before and during the field study to avoid exposure to dangerous floods/cyclones. High temperatures will be addressed by wearing sun cream

<p>and covering up during times of exposure and having a constant supply of water and hydration powders throughout the trip. Heat of the day will be avoided by carrying out data collection early in the morning or later in the afternoon.</p> <ul style="list-style-type: none"> - I will always travel with another person (in pairs) to avoid being targeted by local crimes or getting into an unsafe situation. - Take out medical insurance from Southampton University that would cover the medical costs of healthcare overseas. - Purchasing a mobile phone with an Indian sim card and noting the phone number of emergency services and storing this in the mobile device.
<p>Please specify potential <u>distress or harm to YOU</u> arising from your proposed research activity. (<i>Give consideration to the possibility that you may be adversely affected by something your participants share with you. This may include information of a distressing, sensitive or illegal nature.</i>)</p> <ul style="list-style-type: none"> - Culture differences may lead to distress, especially as a young woman in India. Risk: Low Risk. - Interviews containing distressing information. Due to discussing possibly sensitive topics with women in the interviews, there is a risk if distressing information being disclosed by the participants. Risk: Low Risk. - Risk of participants responding negatively to interviews. There is a risk of participants responding badly to the interview question and getting angry at the interviewer. Risk: Low Risk.
<p>What precautions will you take to minimise these risks?</p> <ul style="list-style-type: none"> - I will make myself aware of cultural practices in the Bengal delta before travelling. - I will make effort to remain impartial during interviews and not that discovering harsh realities is the nature of research in this subject area and remain sensitive to the participant and their emotions throughout the interview. - If participants display signs of anger or distress during the interview I will pause the interview immediately and ask the participant if they wish to continue. If I feel in danger I will remove myself from the interview immediately and make my colleagues aware of the situation.
<p>Part 3 – Potential risks to YOUR RESEARCH PARTICIPANTS</p>
<p>Please consider potential <u>safety risks</u> to participants from taking part in your proposed research activity? (<i>Give consideration to aspects such as location of the research, risks associated with travel, strain from participation, and assess the likelihood and severity of risks.</i>) <i>If you have already completed a departmental H&S risk assessment, this may be attached to cover these aspects.</i></p> <ul style="list-style-type: none"> - Participant safety. The location of the interview might compromise the safety of the participants. As I am interviewing women, they might be at risk when disclosing certain personal information in the interviews, due to the social structure of Indian society.. Risk: Medium Risk.
<p>What precautions will you take and/or suggest to your participants to minimise these risks?</p> <ul style="list-style-type: none"> - Interviews will take place in a location chosen by the participant to ensure they feel safe. - The information a participant discloses in an interview will not be discussed in the field to ensure other members of the community do not gain any of this information.
<p>Please specify <u>potential harm or distress</u> that might affect your participants as a result of taking part in your research. (<i>Give consideration to aspects such as emotional distress, anxiety, unmet expectations, unintentional disclosure of participants' identity, and assess the likelihood and severity of risks.</i>)</p> <ul style="list-style-type: none"> • Women play a key part in maintain the household in this area, so stress might occur to the participant if interviewed for too long Risk: Low Level • The research topic is a sensitive topic. Women could feel distress discussing their life histories in the interviews. Risk: Low Level

<p>What precautions will you take and/or suggest to your participants to minimise these risks?</p> <ul style="list-style-type: none"> • Participants will be made aware of the time the interview takes and also that they are able to end the interview at any given time to ensure they do not feel under pressure or distressed from the time they give the research. • If a participant appears to be becoming distressed they will be asked if they wish to continue and given the opportunity to end the interview.
<p>Part 4 – Potential wider risks</p>
<p>Does your planned research pose any additional risks as a result of the sensitivity of the research and/or the nature of the population(s) or location(s) being studied? <i>(Give considerations to aspects such as impact on the reputation of your discipline or institution; impact on relations between researchers and participants, or between population sub-groups; social, religious, ethnic, political or other sensitivities; potential misuse of findings for illegal, discriminatory or harmful purposes; potential harm to the environment; impacts on culture or cultural heritage.)</i></p> <ul style="list-style-type: none"> • As the culture is different in India, unintentionally offending any locals or interview participants whilst out in the field is a risk. The subsequent ramifications could reflect poorly on Southampton University and Jadavpur University. The degree of offense may differentiate depending on the areas religion, political views and socio-economic group.
<p>What precautions will you take to minimise these risks?</p> <ul style="list-style-type: none"> • I will dress and act appropriately to Bengalese culture and research the culture of the area before the study, so I am aware of the cultural practices. Also, I will ask for advice from the guides if unsure of certain behaviours.

CONTINUED BELOW ...

<p>Part 5 – International Travel</p>
<p>If your activity involves international travel you must meet the Faculty's requirements for Business Travel which are intended to:</p> <ol style="list-style-type: none"> 1. Inform managers/supervisors of the travel plans of staff and students and identify whether risk assessment is required. 2. Provide contact information to staff and students whilst travelling (insurance contact details, University contact in case of emergency etc.) <p>Full details are provided in the Faculty H&S Handbook in the Business Travel section. Selecting Business Travel from the Contents list will take you straight to the relevant section.</p>

Departmental H&S risk assessment attached (for Part 2/3)	YES /NO	(Delete as applicable)
Business Travel and Risk Filter Form attached (Part 5)	YES /NO	(Delete as applicable)

