Seaweed Farming and Intra-Household Gender Relations on Songo Songo Island, Tanzania

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Dedication

To my late parents Abdallah Besta and Fatna Binti Abubakar, may God the Almighty reward you for every letter I have learnt and for your efforts to send me to school in the first place.

To my beloved auntie, mentor and guardian Dr. Sitna Mohamed, who introduced me to higher learning education and research; gone so soon, I miss your guidance.

To the Songo Songo women for your perseverance and hard work; you inspired me never to give up, even in the darkest moments of my life; you are my heroines!

Abstract

This study examines gender relations within a highly dynamic social and ecological context. It focuses on how men and women use marine resources for their livelihoods and how the rise of seaweed farming and its decline due to plant disease have affected intra-household gender relations on Songo Songo Island in Tanzania. Little is known about the effect on coastal people of micro and macro forms of social institutions in terms of class, gender and other factors, or of how they affect their rights to access, control and use marine resources. This thesis contributes to social-ecological understanding of the crossing point between natural environment and social processes by showing the relationship between temporality and gender relations in the context of marine resource utilisation in Tanzania.

Following a case-study approach, field research was conducted on Songo Songo Island using qualitative and quantitative techniques such as in-depth interviews, focus groups, semi-structured interviews, household surveys and participant observation. The main research question asks: How does the rise and decline in seaweed farming affect intra-household gender relations on Songo Songo Island? This was guided by three themes: gendered livelihood strategies, gendered access to marine resources and intra-household gender relations.

The study finds that Songo Songo households engage in a number of livelihood activities including fishing, fish processing and marketing, seaweed farming, octopus collecting and formal employment (both skilled and unskilled at the gas plant, hospital, airstrip, and primary school). Within the frame of the socio-cultural patterns of the fishing village, Songo Songo women perform both reproductive and productive roles. The structured social differences among Songo Songo men, according to the category of fishers to which they belong, and women, according to their marital status, determine their access to marine resources. The decline of seaweed farming has created a vacuum for women with no alternative income, forcing them to shift their farms from one place to another in search of areas around the island where seaweed might thrive. Access to marine resources is also influenced by temporality such as tidal changes and trade winds. These temporal variations affect female seaweed farmers' contribution to household income, which in turn affects intra-household gender relations. The overall decline in seaweed farming has reduced their income and limited their economic activity, affecting their power to bargain and negotiate with men. The women's degree of power also depends on several other factors that influence perceptions of their contributions including cultural norms, gender ideology and social networking.

This thesis calls for gender analysis of coastal livelihoods to reveal the multiple forms in which gender relations are exercised, negotiated and understood in the utilisation of marine resources. It is hoped that the key information presented in this case study and its recommendations for the use of the marine resources in the Songo Songo archipelago will make a significant contribution to development sector understanding of intra-household gender concerns and power relations.

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Abbreviations

BAKWATA	Baraza Kuu la WaislamuTanzania
BMU	Beach Management Unit
CCM	Chama Cha Mapinduzi
CDM	Conservative Democratic Movement
COSTECH	Tanzania Commission for Science and Technology
CUF	Civic United Front
DNRD	District Natural Resource Department
EAME	East Africa Marine Eco-region
FAO	Food and Agriculture Organisation
GAD	Gender and Development
ICM	Integrated Coastal Management
ICRISAT	International Crop Research Institute for Semi Arid Tropics
NGO	Non-governmental Organisation
PBUH	Peace Be Upon Him
RUMAKI	Rufiji-Mafia-Kilwa Seascape Programme
SPSS	Statistical Package for Social Science
TCMP	Tanzania Coastal Management Partnership
TGNP	Tanzania Gender Networking Programme
TZS	Tanzanian shillings
URT	United Republic of Tanzania
USD	United States dollars
VEO	Village Executive Officer
VICOBA	Village Community Bank
WCED	World Commission on Environment and Development
WEO	Ward Executive Officer
WIOMSA	Western Indian Ocean Marine Science Association
WWF	Worldwide Fund for Nature
ZASCOL	Zanzibar Agro Seaweed Company Limited

Chapter 1: Introduction

1.0 Introduction

Gender shapes the opportunities and constraints that men and women face in securing a safe environment, feasible livelihoods and strong communities across ecological, political, economic and cultural settings. Natural resource utilisation and gender issues have become increasingly central to the coastal communities in Tanzania because decisions affecting marine resources and gender relations are politically and socially constructed.

The gender analysis of coastal livelihoods is becoming an important aspect of the disaggregation and interpretation of information about the roles of households and communities in the utilisation of marine resources. Understanding gender in this particular context is instrumental in the exploration of alternative approaches to the effective and equitable management of marine resources for sustainable livelihoods.

1.1 Rural Coastal Communities in Tanzania

Most coastal villages in Tanzania are located on land made up of coral rag,[1] where the soil and hydrology are poor and livelihoods are primarily for subsistence, consisting mainly of smallholder farming, forestry, artisanal fishing, lime and salt production, livestock husbandry, handicrafts and seaweed farming (Whitney et al., 2003). The majority of these rural coastal communities are very poor[2] and depend directly on coastal, marine and forest resources for their daily survival and income. One outcome of such dependence is vulnerability to a broad range of factors, key among which are environmental change and climatic variability including the long and short rainy seasons. These communities are also subject to other social and economic fluctuations whose potential consequences have altered gender relations, with significant implications for the nature of the livelihoods of the majority of rural coastal people and their poverty reduction measures.

As social entities and as economic and ecological zones, Tanzanian coastal communities demonstrate a distinct set of interactions between the natural environment and the people depending on it. It is important to understand intra-household gender relations in this context. Since Tanzania culture is greatly influenced by patriarchy, it seems possible to study and explain gender-biased decision making, control, ownership and accessibility with regard to natural resource use and management in coastal areas.

[1] Rubbly limestone composed chiefly of petrified coral.
[2] About 36 per cent of the Tanzanian population lives below the poverty line. In rural coastal areas, on average 40 per cent of the population are below the basic needs poverty line (URT, 2005).

The major occupation in these coastal communities is artisanal fishery, which provides both income and the main source of protein. This activity is mainly undertaken using simple gear and vessels such as dugout and outrigger canoes, dhows and small boats driven by sail or engine. Fishing gear includes traps, hooks and lines, nets and spears; however, there is a problem of destructive fishing (Ngusaru et al., 2001). According to the 2003 Tanzania State of the Coast Report (Whitney et al, 2003), inshore fishing has doubled in less than 20 years, leading to overexploitation of the inshore fisheries of Zanzibar and mainland Tanzania, the degradation of shallow reefs and a decline in fish stocks. In the absence of deep sea fishing, severe and persistent pressure is exerted on the inshore coral reef system where majority of poor people fish (Whitney et al., 2003). It is in this context that seaweed farming was introduced as an alternative livelihood.

It is estimated that 30,000 people were engaged in seaweed farming in 2003 and that 7,000 tonnes of dry seaweed were produced per year from 2000 to 2003 (Whitney et al., 2003). Sievanen et al., (2005: 310) claim that: “Combined with other resource management tools, the seaweed industry can contribute to an integrated seascape approach that balances multiple uses of natural resources with the social well-being of coastal communities and fishers’ households”.

1.2 Trends in and Importance of Seaweed Farming in Coastal Tanzania

The exploitation of seaweed in Tanzania occurred as far back as the 1950s, when *Eucheuma* seaweed was harvested from the coastal waters of the islands of Unguja, Pemba and Mafia, dried and exported to Europe. However, the methods used were unsustainable and destructive, as the entire plant was uprooted, preventing regeneration and regrowth. A number of studies have attempted to explore the economic viability of seaweed farming for the population of Tanzania’s coastal areas. Mshigeni’s (1998) prominent study explored the conservation of seaweed as an economic activity to improve coastal people’s livelihoods and resulted in the seaweed farming phenomenon. The University of Dar es Salaam established pilot seaweed farms in 1982-1983 in Kigombe in Tanga, Fundo Island in Pemba and Fumba bay in Southern Zanzibar, where two local species of *Eucheuma* were tried.

The first commercial seaweed farms in Zanzibar started in 1989 when entrepreneurs imported and introduced two fast-growing species of *Eucheuma* from the Philippines which adapted well to Tanzania’s marine ecosystems and now constitute the bulk of seaweed cultivated there (Msuya, 2006). By 1998, over 30,000 coastal people were actively engaged in farming *Eucheuma*, of which 80 per cent were women (Nanyaro, 2005). With Tanzania’s marine conditions allowing seaweed cultivation all year round and short production times

compared to the Philippines,[3] there is potential for poverty reduction in coastal communities if *Eucheuma* is farmed sustainably (ibid). It is also important to understand the trends in seaweed farming in coastal Tanzania because they provide one of the perspectives from which intra-gender household relations in livelihood dynamics have been explained (Msuya 2000).

1.2.2 The Importance of Seaweed Farming

Seaweed can be harvested from wild, naturally-growing or farmed stock. It is claimed to be sustainable both environmentally and socially and provides income opportunities for coastal villagers, especially women (Nanyaro, 2005). The types of seaweed found in Tanzania are also found elsewhere in the world (Mshigeni, 1998) and are harvested for human consumption and industrial use as a source of the hydrocolloids agar, algin and carrageenan, which are used as thickeners and emulsifiers in food and other products (Lundsør, 2004). Hydrocolloids are used as a thickening, gelling, stabilising and emulsifying agent used in livestock feed supplements, agricultural fertilisers, human food (for example in salad dressings), textile printing pastes, toothpaste and various types of creams, shampoos and lotions, as well as in waxes, polishes, fruit juices and medicinal products, including medicinal syrups (Mshigeni, 1998; Crawford, 2002).

The carrageenan industry consumes more than 130,000 MT of seaweed per annum, 85% of which comes from farm production in the Philippines, Indonesia and Zanzibar. The Philippines produces in excess of 80,000 MT of *Kappaphycus alvarezii* seaweed, commercially known as '*cottonii'* per year. The continuing success and growth of the carrageenan industry is largely due to the development of *cottonii* and *spinosum* farming. In Tanzania it is estimated that more than 30,000 coastal people are directly involved in farming *cottonii* (Nanyaro, 2005). This is an indication of the importance of seaweed farming to the economy of the country as a foreign currency-earning export crop as well as a poverty reduction strategy of coastal communities. For example, in Zanzibar seaweed farming contributes significantly to the economy; seaweed made up 15 and 27 per cent of exports in 1993 and 1994 (Msuya 1996). Seaweed farming has greatly improved the living standards of the people. As various studies have shown, seaweed has helped farmers to buy clothes, household items, school uniforms, books and pay school fees. There is also evidence that fewer children suffer from malnutrition in the village studied (Eklund and Patterson, 1992; Msuya 1995; 1996; Sechambo et al., 1996).

[3]While *Euchema* takes eight weeks to ripen for harvesting in the Philippines, in Tanzania it takes only four weeks.

Seaweed farming was introduced in integrated coastal management projects in Tanzania both to raise the socioeconomic status of coastal communities and to provide an alternative income for fishers practicing destructive techniques such as blast or cyanide fishing (Msuya 1996). It is part of a diversified household livelihood strategy that allows communities to adapt to changing conditions (Bryceson, 2002). About 90 per cent of seaweed farmers are coastal women with limited alternative economic opportunities (Msuya, 2005).

Various studies have shown that as a livelihood activity, seaweed farming has helped to improve the economic conditions of farmers, most of them women (Mshigeni, 1998; Lundsør, 2004; Msuya et al., 2007). On Songo Songo Island, seaweed farming was introduced as a pilot project in 1998 in which a number of women participated (Msuya 1998). The Tanzanian government has called for the aggressive expansion of seaweed farming in the recently-adopted Seaweed Development Strategic Plan (Nanyaro, 2005). The plan calls for an expansion in *cottonii* farming, which commands a higher farm-gate price than *Eucheuma denticulatum*, commercially known as *spinosum* (Msuya et al., 2007)

Further findings by Wallevik and Jiddawi (2001) have also suggested that the decision of a number of women to engage in seaweed farming is primarily influenced by the objective of sustaining their households, especially when men's fishing activities are affected by seasonality. Mwaipopo's (2001) study of Saadani village in Tanzania reports that any activity that brought substantial income to the women of the household was highly regarded, due to its contribution to daily living as well as giving the women a sense of identity and personality. Another study claims that the participation of women in seaweed farming has been seen to elevate their status in their villages, increase their economic independence and decrease rural urban migration (Pettersson-Löfquist, 1995; Wallevik and Jiddawi, 2001; Msuya, 2011a).

According to Mwaipopo (2001), Saadani women's recognition of new types of work that can give them access to an independently-controlled income was the impetus behind many women's decision to get involved in seaweed farming. A similar quest amongst the women to acquire status in Zanzibar has resulted in seaweed farming becoming a major source of income for female farmers (Wallevik and Jiddawi, 2001). Despite increasing their workload, the positive aspect is that it has increased their purchasing power as well as creating greater social empowerment for women (Ako 1997, Msuya 2006a).

Msuya (2000) finds that social relationships in Zanzibar households have been affected by seaweed farming. For Zanzibar's women, who have traditionally had no means of earning money, this new income often brings domestic conflict. Some husbands claimed that their

wives had become less obedient, and some women indicated that they had to give their husbands money in order to be allowed to continue seaweed farming (Msuya, 1997).[4] Some men also claimed that their wives no longer joined them in working on their land-based agricultural crops because of their involvement in seaweed farming (Msuya, 2000). In this context, the major aim of this research is to examine how the rise and decline[5] of seaweed farming and production has affected the gender relations of seaweed farmers in their households. I look at the implications of this rise and decline in seaweed farming and the associated shifts in the livelihoods of people living in one coastal area in Tanzania in relation to temporality, climate variability and household gender relations.

The main aspects that I explore in detail are temporality,[6] gendered access to marine resources and the changing dynamics of household gender relations. Based on the findings for each of the above aspects, I address a number of research gaps relating to seaweed farming and how the gender relations within households shapes or constrains men and women's livelihood opportunities in rural coastal areas.

1.3 Research Objectives and Questions

This research examines how seaweed farming and production affects gender relations in seaweed farmers' households in times of both high season and decline. This aim is achieved by understanding the relationship between the temporality of marine resource use in coastal livelihoods and intra-household gender relations. The three primary objectives of this research are as follows:

to examine the effects of the rise and decline of seaweed farming on intra-household gender relations;
to examine the effect of temporality on access to marine resources and livelihoods;
to investigate how gender relations influence access to marine resources in Songo Songo households.

1.3.1 Research Questions

How has the rise and decline in seaweed farming affected intra-household gender relations on Songo Songo Island?

[4] Women say that they give this money to their husbands to 'cool them down' (Msuya 2000)
[5] The peak of seaweed farming on Songo Songo was between 2000 and 2003; by year 2005 the seaweed had started to decline. For details of the rise and decline of seaweed on Songo Songo Island see Chapter 4.
[6] Temporality in this research means variations caused by daily and monthly lunar tidal changes and annual trade winds.

1. What are the Songo Songo livelihood strategies, and how does seaweed farming affect household income?
2. How do temporality and other factors affect gendered access to marine resources on Songo Songo Island?
3. How does the income of seaweed farmers affect household gender relations?
4. Has women's negotiating or bargaining power changed due to the decline in seaweed farming?

1.4 Research relevance and justification

In analysing the relationship between humans and seaweed and the significance of seaweed farming in livelihoods in Tanzania, some of the aspects given serious consideration here include gender relations in a social-ecological context. The focus is on how men and women use coastal resources in distinct settings and capacities in relation to poverty reduction and their intra-household relations. Natural resource management strategies such as Tanzania's National Integrated Coastal Environment Management Strategy (Nanyaro, 2005) cannot achieve their goals of poverty eradication and conservation unless gender and class relations are implicated in natural resource management policies and projects.[7,8] This is mainly because the social world exists and must be analyzed in relational terms, across power relations and featuring destructive divisions of gender, colour, sex, class, sexuality and nation, all of which are subject to transformation (Acker 1988). For instance, class and gender relations stem from the social organisation of a particular society and determine access to, control and use of resources, including marine resources.

Despite the introduction of seaweed farming to fishing communities as an alternative or supplement to other livelihood activities, particularly for coastal women (Msuya, 1998; Crawford, 2002; De la Torre, 2006), there is evidence to suggest that some women are disadvantaged in a number of ways as a result of a broad range of sociocultural and contextual issues (Eklund and Patterson, 1992; Msuya, et al., 1996; Sechambo et al., 1996); however, there is little literature on the impact of the decline of seaweed farming on gender or intra-household relations. This research explores how the rise and decline of seaweed farming have affected intra-household gender relations in coastal areas in Tanzania.[9] When

[7] This research focuses more on intra-household gender relations.
[8] Gender refers to socially-constructed roles that women and men play in their daily lives. It also entails power relations and differences between men and women's control over and access to resources and technology (Mohanty 1991; Morgan et al 1986).
[9] I concentrate only on gender as an aspect of intra-household differences, and do not address other gendered asymmetries. I acknowledge the existence of other intra-household differences that affect decision-making processes and the allocation of resources such as age, illness, birth order, and relationship with the head of the household and disability.

fisheries officers introduced seaweed farming to the fishing communities in the Mtwara and Lindi regions in Tanzania in 1996 under Rural Integrated Project Support (RIPS), the women were ready to start farming; the majority were fishing sardines using cloth or mosquito nets and collecting octopus, either individually or in organised social groups (Msuya, 1996).

Although the price of seaweed is low and the women farming it suffered an increase in their workload, the introduction of seaweed farming to coastal communities has given them access to an alternative livelihood. Their new experience of utilising marine resources has led to a new understanding of the environment and gender relations (Mwaipopo, 2001). This calls for deeper conceptualisation of the relationship between natural resources and gender in order to appreciate the multiple forms in which gender relations are exercised, negotiated and understood in the management and use of natural resources (Mwaipopo, 2001). However, the decline in seaweed farming and production have affected women's bargaining and negotiating power due to their decreased income and limited economic activity. While the number of women engaging in octopus collecting has increased, as a strategy for gaining more income, it has a negative effect on marine resources.

Much of the work that presents women and women's groups as the focus of natural resource management interventions tends to present women as a homogenous group separate from men. This downplays the micro-level household conflicts, bargaining and trade-offs generated by differences in gender, age and status (Green et al., 1998), as many empirical studies have consistently indicated. Thus there is very little knowledge about the differentiation of coastal people in terms of class and gender and other differences resulting from both micro and macro forms of social institutions, and how these affect rights to access, control and use of coastal resources. This thesis also examines how the rise and decline in seaweed farming and production have affected seaweed farmers' household's gender relations to show how environmental health and human wellbeing are both connected and disconnected. This is important for understanding how temporal fluctuations affect the wellbeing of poor people who depend on marine resources for their livelihoods.

By studying the rise and decline of seaweed farming and its effect on intra-household gender relations, this research significantly contributes to the socio-ecological understanding of the crossing point between natural and social processes and the relationship between natural and human well-being in the context of marine resource utilisation and climate in Tanzania. It also provides empirically-based knowledge for conservationists, poverty alleviation project organisers, planners and policy makers on the influence of local realities embedded in the social institutions linked with macro influences that determine the utilisation of marine

resources. Such an understanding can contribute significantly to the formulation of poverty reduction and marine resource conservation policies and programmes that are sensitive to local realities, including gender inequalities. Finally, the study indicates other areas in which further research is needed on poverty reduction, temporal fluctuations and gendered intra-household relations in Tanzania.

1.5 Research Settings

The geographical focus of this research is Songo Songo Island in Kilwa district and Lindi region in Tanzania. The study is informed by an analysis of Tanzania's rural coastal livelihoods and their intra-household gender relations.

As livelihood activities in coastal Tanzania are influenced by the temporality of natural resource use (Mwaipopo, 2001), as this study establishes, it is important to state that the research setting is characterised by monthly lunar tidal variations (spring and neap tides), daily tidal variations and northerly and southerly trade winds. Lunar tides and trade winds have a major seasonal effect on the climate and the availability of fish (ibid). The cold season between June and August is accompanied by a sea swell that influences fish migration and is mainly brought by the southeast trade wind, which blows from April to October (Mesaki, 2005). There are eight production cycles per year in the off-bottom method of farming of *cottonii*'[10]. Within these long seasons the seaweed farmers work on their farms at lunar low tide, which lasts about two weeks (Msuya et al 2007; Sechambo et al 1996). Therefore temporality is a very significant dimension of this study, in particular the contribution of nature to shaping gender and intra-household relations based on socially- and culturally-constructed perceptions and their ultimate impact on the livelihoods of rural coastal populations.

1.6 Organisation of the Thesis

This thesis is structured into eight chapters, each of which makes a distinctive contribution to fulfilling the research objectives. Chapters 1 to 3 present the foundations of the research, while the remaining four chapters present the findings, the discussion, the conclusion and recommendations.

Chapter 1 sets the background to the research problem and presents the research objectives and questions and the structure of the thesis.

[10]The off-bottom method is used in shallow sub-tidal waters a foot deep at the lowest tide, while the floating line method is used in deeper waters at least two metres deep at mean sea level. The floating line method is new to Tanzania (Msuya et al 2007).

Chapter 2 defines the key terms used in the thesis and gives a brief review of the theory and concepts used. It starts with feminist political ecology, followed by the theory of access and the rural livelihoods approach. The Sen's Cooperative conflict model and Whitehead's conjugal contract concept are described last, followed by an overview of all three themes incorporating issues identified in the research.

Chapter 3 presents the study area with an overview of Songo Songo Island, its population, weather conditions and the process adopted for the selection of the study area. It describes the research design and methodology used for the data collection at different levels and phases of the research and provides an outline of the tools and techniques used to answer the research questions.

Chapter 4 discusses Songo Songo Island households' different livelihood portfolios. Going beyond the livelihood approach, it examines sociocultural patterns on the Island, showing the existing gendered livelihood activities and strategies and structured social differences between men (categories of fishers) and women (marital status) which determine their access to marine resources.

Chapter 5 examines the ways in which social relations, power structures and temporality affect access to marine resources and coastal livelihoods on the island.

Chapter 6 discusses the findings on the influence of women seaweed farmers' incomes on their bargaining position in the household. It examines how gender relations were articulated in seaweed-farming households when seaweed farming was on the rise and at the time of its decline.

Chapter 7 summarises all the findings and links the three themes: livelihoods, gendered access to marine resources and intra-household gender relations. It concludes the thesis and discusses how the findings contribute to existing theory and add to existing bodies of knowledge. It also recommends areas for future research.

1.7 Conclusion

There is evidence that seaweed farming has helped to improve economic conditions for farmers, and in particular for the women who form the majority of seaweed farmers in the rural coastal communities. Studying the rise and decline of seaweed farming and how it affects intra-household gender relations contributes significantly to socio-ecological understanding of the crossing point between natural and social processes and the

relationship between natural and human wellbeing in the context of marine resource utilisation and climate in Tanzania.

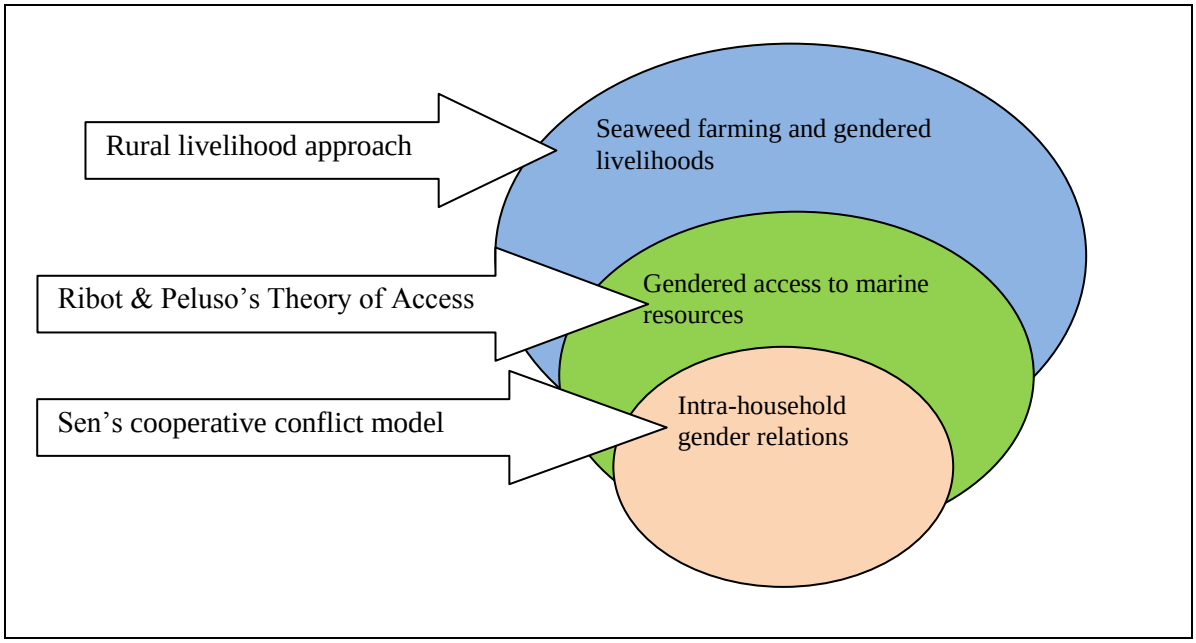
Lack of sufficient knowledge about the differentiation of coastal people in terms of class, gender and other differences resulting from both micro and macro forms of social institutions, and their impact on their rights to access, control, and use coastal resources have been a catalyst for the exploration of seaweed farming and production and its supposed influence on the gender relations of the islands' marine-based resource farmers and their households.

Chapter 2: Livelihoods, Gendered Access and Intra-household Relations

2.0 Introduction

This chapter provides a conceptual and theoretical basis for the study of coastal livelihoods and intra-household gender relations, as discussed in a broad range of the empirical literature. It presents the perspectives from which the research questions, developed in Chapter 1, are appropriately analysed and addressed to identify gaps in previous researches. In order to appropriately address these broad issues, the study focuses on a selected aspect of the rural livelihood approach (Ellis 2000b; Allison and Ellis 2001) to identify the benefits obtained from marine resources and other livelihood strategies of Songo Songo men and women. It also employs the theory of access (Ribot and Peluso 2003) to analyse how Songo Songo men and women access marine resources, and the cooperative conflict model (Sen 1987) to understand intra-household gender relations on Songo Songo Island.

Figure 2.1: Concepts and approaches



Scholars frequently combine approaches or use different approaches in different pieces of research (Bryant & Bailey, 1997). All of the approaches above represent potentially useful ways of understanding how livelihoods such as seaweed farming impact on the intra-household relations of the fishing and seaweed-farming populations on Songo Songo Island. In this research, the rural livelihood approach (Ellis 2000b) is used with the theory of access (Ribot & Peluso, 2003) to look at men and women's livelihood strategies and the

accessibility of and contestation over marine resource utilisation, while Sen's cooperative conflict model is used for intra-household gender analysis. The discussion in this chapter brings together these three different themes

This chapter develops and progresses as follows; section 2.1 defines the household, which forms the unit of analysis in this thesis, and gives a brief definition of other key terms such as livelihood, access, gender and power relations. Section 2.2 discusses the rural livelihoods approach used to frame Songo Songo livelihoods based on both marine-based and land-based resources, emphasising seaweed farming as the central focus. Section 2.3 uses the theory of access as a tool to examine gendered access to marine resources on Songo Songo Island, and gives a brief account of feminist political ecology, describing gendered access to resources. Section 2.4 discusses the concepts of gender and intra-household relations, emphasising Sen's cooperative conflict model, which I use to gain an understanding of the gender relations of seaweed farmers within and beyond their households.

2.1 Key Concepts

This section highlights the key concepts of the research and then discusses the conceptual framework in detail. The discussion draws in various perspectives with regard to the household, gender and livelihoods and access.

2.1.1 The Household

I use the notion of the household as a unit of analysis, which makes it important to define the household in relation to the context of my study. Ellis (2000b) defines the household as "the most appropriate social unit for investigating livelihoods and advancing understanding of the policy implications of various livelihoods". Bird and Bolt (2003) argue that by using the household as a unit of analysis, researchers and policymakers assume what takes place within it, because "household" means different things to different people in different places and at different times. Individuals within a household are often assumed to be equally wealthy or poor, and to have equal access to goods and services (ibid). The household is seen as characterised by both separate and joint production and consumption, and by the interests of its members, with the processes of production, consumption and affecting male and female household members differently (Jackson, 1994; 2000).

A further description of the household assumes that it constitutes “a microcosm whose productive and reproductive functions depend partly on the stage at which a given society finds itself in its economic and social transformation” (Beneria (1979:215). According to Haddad et al (1997), the “household is a ‘site of largely separate gender-specific economies linked by reciprocal claims on members’ income, land, goods and labour”. From another perspective, the household is seen as made up of “a group of individuals who sleep and eat in a common dwelling unit” (Llyod and Gage-Brandon, 1994).

In all of these different definitions the household is seen as a unit of production, distribution, consumption and co-residence. According to Locke and Okali (1999), the household is made up of a group of people who are not expected to have the same interests and aspirations; however there are specific cultural and cross-cultural variations in the ways that the indicators of the household combine to shape it in a given social context. Songo Songo households have all the features described in this definition, shaped by the religious ideology and culture of the coastal people of Tanzania. They fall close to this definition of the household:

> *A household comprises a person or group of persons generally bound by ties of kinship who live together under a single roof or within a single compound and who share community of life in that they are answerable to the same head and share a common source of food. (Casley and Kumar, 1988:6)*

2.1.2 Livelihoods and marine livelihoods

The “livelihood” concept has also been described in many different ways, each attempting to characterise it from a specific dimension. Ellis (2000b) describes livelihood as comprising assets, activities and the access to these activities which are mediated by social relationships and institutions determining the living gained by a household or an individual. The definition of livelihood adapted by DFID from Chambers (1989) and Carney (1989) is as follows:

> *A livelihood comprises the capabilities, assets and activities required for means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future while not undermining the natural resource base. (Carney, 1989)*

According to Townsley (n.d) the adoption of this holistic interpretation of livelihoods has significant implications for our understanding of the affiliation between people and the ecosystems in which they live and on which they may depend for their livelihoods. Reliance

on the use of marine resources is frequently high, mainly in coastal areas, mostly because of the relative diversity and abundance of resources that can be found there (ibid). Scoones (1998) argues that the sustainable rural livelihood as a framework of analysis is essential to the debate on poverty reduction, environmental management and rural development. According to Ashley and Carney (1999), livelihood activities comprise the cultivation of food and cash crops, use of natural resources, seasonal/year-round labour, formal employment, processing of food, home gardens, informal trades, labour sales and exchange, borrowing, scavenging, stealing and begging.

Livelihoods also need to be understood as dynamic – subject to shocks, changes and seasonal effects – particularly when they depend heavily on access to natural resources, as is often the case among people living in coastal areas (Townsley, n.d). The dynamic nature of coastal environments means that people's ability to sustain coastal and marine livelihoods in the face of shocks and changes is particularly important (ibid).

Taking into account the discussion of livelihoods above, the term "marine livelihoods" also has several interpretations attached to it. On the one hand these are livelihood strategies that include some form of dependence on the use of marine ecosystems or products derived from those ecosystems (Townsley, n.d). Direct users of coastal and marine resources include the owners and crews of fishing enterprises and waterborne transport vessels, shrimp and fish fry collectors, coral and sand miners, salt makers and mangrove cutters (Townsley, n.d; Whitney et al., 2003). However, an even larger group of people indirectly uses coastal resources and depends on their exploitation for raw materials for their processing, trading and other activities (Allison & Ellis 2001). These are fish processors and traders, operators of cold storage and ice factories, traders whose goods are transported by sea, operators of aquaculture enterprises, builders who use sand and coral, and salt traders (Townsley, n.d). Although many of these actors may not even live in coastal areas, they can all be regarded as having a stake in the exploitation of marine ecosystems. Even for those directly involved in the use of coastal and marine resources, this often represents just one of the elements in their livelihoods (Allison & Ellis 2001). It may be more or less important, but it is certainly influenced by the other options open to them, the various direct and indirect factors in play and the vulnerability that they have to deal with (Allison & Ellis 2001; Townsley, n.d).

2.1.3 Gender

Sex refers to the biological differences between men and women, while gender refers to the socially-acquired notions of masculinity and femininity by which women and men are

identified (Momsen, 2004). Gender defines the relations between men and women, both perceptual and material, away from the biologically-determined sexual characteristics of either women or men. This difference is socially constructed.

Gender assumes a central role as an organising principle in societies, and often governs processes of production and reproduction, consumption and distribution (FAO, 2005: 13); the resulting notions are reinforced by traditions that continue to socialise individuals around these respective constructions of gender roles and relations (Helmore and Singh, 2001). Gender therefore, is a concept that aids our understanding of how society operates, through the study of the negotiation of power and influence between men and women (Bennett, 2005). Because it is a sociocultural construct it changes across time and space and is constantly created and recreated through human interaction (Lorber, 1994).

Gender is a culturally-specific set of characteristics that identifies the social behaviour of women and men and the relationship between them (Okali, 2006). In this thesis it refers to the social differences between women and men, which are learned, change over time and vary widely both within and between cultures (ibid). Gender also refers to the different roles that men and women play in society and the relative power they exert (ibid). Whilst gender is articulated in different ways in different societies, it is rare for men and women to have equal roles or hold equal positions of power in any society. The impact of this inequality on women's lives varies extremely (Riley, 1997). Despite power and resource inequalities, women often obtain their own income through farm and non-farm activities (Ellis, 2000b).

Gender analysis is the systematic examination of the roles, relationships and processes between men and women in all societies, focusing on imbalances in (decision-making) power, wealth and workload (Okali, 2006). Gender analysis can also include examination of the multiple ways in which women and men, as social actors, engage in strategies to transform existing roles, relationships and processes in their own interests and those of others. Gender analysis is cross-cut by other axes of social differentiation including class, caste, ethnicity and age (ibid).

According to Bird and Bolt (2003), “gender is the most widely discussed aspect of intra-household difference”. Within the household there is a socially-constructed gender division of labour that usually demands greater time and energy from women than from men (Moser, 1993), with the substitutability of female and male labour for particular tasks often limited (Kabeer, 1991). Under patriarchal social systems, men, who often control household property, resources and income, commonly subordinate women (Ellis, 2000b). These

uneven power relations often result in discrimination against women and girls in the intra-household distribution of resources including food and access to healthcare and education (Kabeer, 1994).

Whitehead and Kabeer (2001) argue that one of the paradoxes of gender relations in Sub-Saharan Africa is that while women play a significant part in production, families and rural households have become institutions of considerable gender inequality. Besides their unequal work burden and access to resources, rural women in Sub-Saharan Africa are less educated than men and have much less agency and capacity to act. Men and women have different and often changing access to and control over decision making, and specific knowledge about natural resource utilisation processes (Rocheleau et al., 1996) These men and women are not homogenous or fixed groups but are differentiated by social categories of gender, class, caste, ethnicity and age (ibid).

2.1.4 Gender and power relations

Power relations are neither fixed nor static, but rather are negotiated across space and time and depend on various factors in the local context (Cornwall, 2002). Gender analysis helps to identify these spaces and to identify strategies for manoeuvring so that more marginalised groups may have access to and control over natural resources and benefit from them (Okali 2006). Power relations between these different groups are greatly influenced by gender, class and ethnicity, and often determine who may have access to forest and its products, who manages the water resources in the community and who decides which crops are planted where (ibid). Groups such as the poor, the socially and politically outcast and ethnic minorities are often the most marginalised, with limited decision-making power regarding how the ecosystem and resources are managed (Rocheleau et al., 1996). In many countries women are particularly disadvantaged, with limited ownership and access rights to resources. However, sometimes marginalised groups, including women, may be able to negotiate access to resources with those with more powerful access and decision-making ability (ibid).

Decision-making power is in the hands of the husband or the head of the family. In a few nuclear families, men take advice from or involve women in decision making related to major family issues (Whitehead, 1981). Not taking part in or being kept from decision-making takes away the ability to influence the decisions taken and limits bargaining power where decisions are being made. Greater participation results in more space for bargaining, as participation in one area of decision-making strengthens the bargaining position in others. When women participate more in the decision-making process, the chance of them having a positive effect

will be greater. Gender issues are pertinent to the extent that they shape not only the different roles and responsibilities of women and men but also the relations between them and how these affect access to and control over natural resources.

2.1.6 Access

Access is the freedom or ability to obtain or make use of (Merriam-Webster 1993:6) According to MacPherson (1978:3), the term "access" is closely related to the term "property", which characterises as a right in the sense of an enforceable claim to some use or benefit of something. According to Ribot (1998), "right" is a prescriptive term that implies an acknowledged claim that society supports through customs, law or convention, while "ability" is a descriptive term that depend on the demonstration without the need of any socially articulated approval. Access includes the *de jure* or *de facto* governing of the utilisation of resources, which are the rules made by the state, non-state groups and non-rule-based structural and relational mechanisms (ibid).

The poor must be able to access natural resources (land, forests, water, fisheries, pasture, etc.) if communities are to have a successful sustainable strategy for poverty reduction. The livelihoods of rural people without or with very limited access to natural resources are vulnerable in a number of ways. A vulnerable community or household is characterised by difficulty in obtaining food, accumulating other assets and recuperating after natural or market shocks or misfortunes.

I argue that emphasis on the livelihoods perspective in terms of resource access rather than resource ownership is a progressive move. It has the potential to significantly reduce or eliminate biased perceptions and type of livelihoods that disadvantage females in intra-household gender relations, and to redefine access to resources that allows equal opportunities to acquire and exploit marine resources and take key decisions about alternative livelihood strategies when the current one is unsustainable.

A conceptual model of *access* in the context of natural resources management as developed by Ribot (1998) and Ribot and Peluso (2003) is adopted (see section 2.3). Ribot and Peluso define access as "the ability to derive benefits from things" or resources (ibid: 153), and recognise a broad spectrum of access mechanisms which include technology, capital, markets, labour, knowledge, authority and social identity.

2.2 The Rural Livelihoods Approach

This section deals with the theoretical construct of the first part of the study, rural livelihoods. It commences by looking into the livelihood activities of rural men and women in order to set out the contextual basis for the analysis of gendered access to marine resources and intra-household gender relations, as affected by women's income.

The rural livelihoods approach is a framework that can help to bring a fuller understanding of adaptive marine livelihood strategies into the policy arena of small-scale fisheries management in low-income countries (Allison & Ellis 2001), and is increasingly used by development agencies and NGOs to achieve a better understanding of natural resource management systems (ibid).

The livelihoods approach seeks to improve rural development policy and practice by recognising the seasonal and cyclical complexity of livelihood strategies. It attempts to remove constraints to access, to assets and activities that complement existing patterns, and identifies ways of making livelihoods better able to cope with adverse trends or sudden shocks (Allison, 2005). This is an important aspect of this research into the rise and decline of seaweed farming, which is instrumental in understanding how temporality, trends and shocks affect coastal people's livelihoods and impact on household gender relations. It is also critical to understanding how available household assets determine the accessibility of marine resources due to weather-influenced seasonality (Allison & Ellis, 2001). For example, during the season of the southerly trade winds, women have limited access to the reef for octopus collecting and men cannot go fishing in deep water due to the unsuitability of their fishing vessels.

The livelihoods approach focuses on the links between individual or household assets, the activities with which a household with a given asset profile can engage and the institutions that control access to assets and to alternative activities (Ashley and Carney, 1999).The origin of this approach is partly derived from the empirical literature dealing with various perspectives on rural families' ability to cope with crises such as drought, flood, pests and disease. The central focus is the rural people' assets and how different patterns of asset-holding can a make considerable difference to the ability of families to withstand shocks (Swift, 1989a). This set of concerns is also linked to the concept of vulnerability, defined as a high degree of exposure to risks, shocks and stresses, and proneness to food insecurity (Chambers, 1989; Davies, 1996).

Chambers' (1989) definition of 'livelihood' is "...adequate stocks and flows of food and cash to meet basic needs". The resources at a household's disposal comprise human capabilities

– skills, education, and the ability to work (including the availability of work and the health and nutritional status of workers) – and other assets such as natural resources, savings and financial resources, and the web of social relations in which members of the household engage. Decisions regarding how these resources are mobilised and allocated and the activities that result from these decisions constitute livelihood strategies. These include not only activities that directly earn income but also the coping strategies used when normal income-generating activities fail or are inadequate. Moreover, they include other household activities that do not generate income but are necessary for the household's welfare. The income, however much or little, resulting from these activities must be allocated to competing demands – consumption, investment, or savings – in order to achieve the desired outcomes, which include meeting basic needs such as food security, nutrition, health, water, shelter, education and a healthy environment.

Desired outcomes also include other, less tangible variables including social relationships and participation in community activities. The outcomes achieved in one time period have a direct effect on the assets that an individual or household can utilise in the next: for example, sacrificing consumption to improve savings or investment will result in improved financial assets but weakened human capabilities, and vice versa. Assets, strategies and outcomes at the household level must be understood in context: the major contextual factors to consider are those that increase or decrease vulnerability in the political, economic, social, and institutional contexts in which the household is situated.

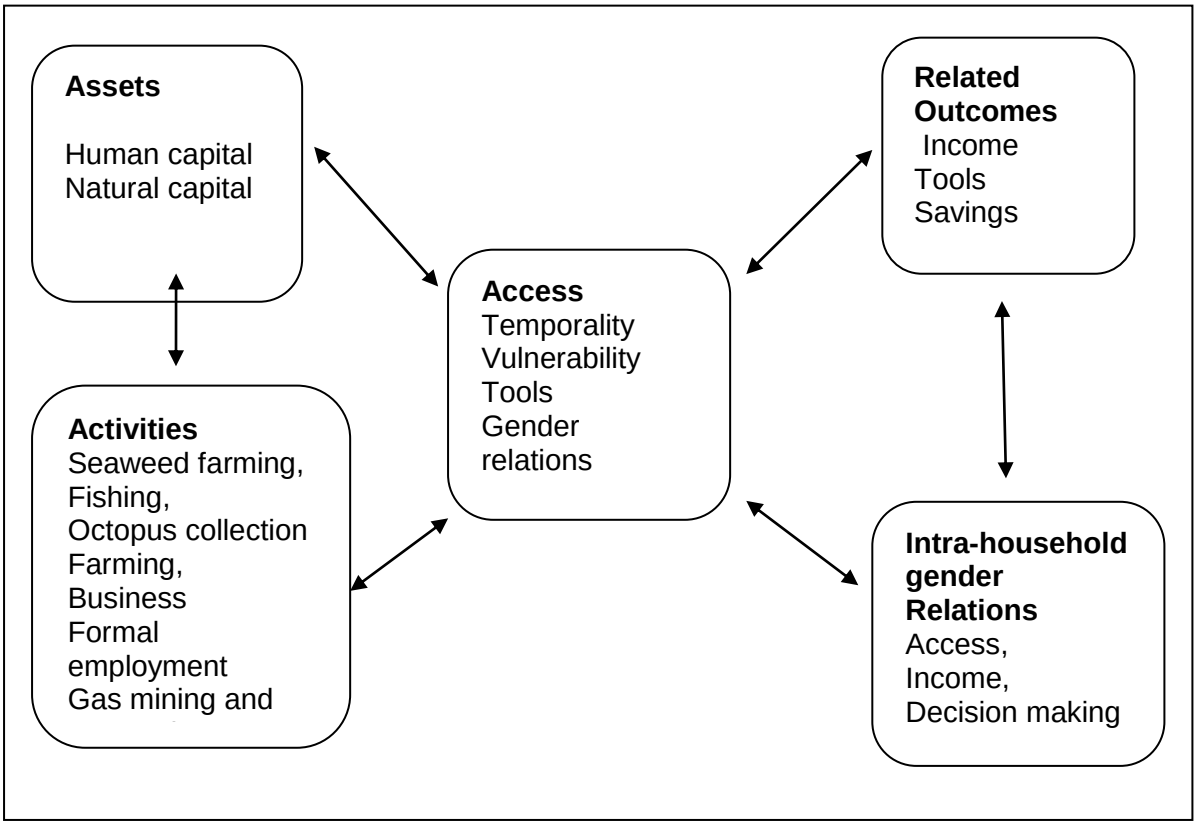
According to Niehof and Price (2001), livelihood generation consists of activities, and the resources and assets needed to carry them out. The authors assume that these activities are interrelated and affect one another due to their all being geared towards the objective of securing and enhancing a livelihood. This multifaceted and dynamic system is described as the livelihood system. Livelihood activities are of various kinds, and all the different activities carried out for the achievement of a certain livelihood are called a livelihood portfolio (ibid). Within the household there are joint livelihood strategies and joint decision making, but individuals may also have their own strategies and make decisions for themselves or for the whole household. The gender-based division of household labour is based on the different roles of men and women, which reflect their culture.

Other factors, such as wealth and social position, also impact upon gender roles. This results in men and women having different responsibilities and also possibly different livelihood strategies (Niehof and Price, 2001) and different tasks, and thus allocating their time differently. Women tend to have more restricted access to resources than men, even

when working together in the same enterprise, and their control over and access to human, material and environmental resources is also different. Gender is an important livelihood generation asset that can be divided into tangible assets, such as the right to own land, and intangible assets, such as gender-based indigenous knowledge and support networks (ibid).

Livelihood portfolios differ between households as well. This is not only culture-specific but also depends on the different strategies taken by men and women in the different households in a community (ibid). The main argument in this thesis is that the livelihoods perspective addresses some of the fundamental questions about change and differentiation in societies, and therefore adopting this perspective provides an ideal context for taking the gender-intrahousehold relations forward (Bebbington, 1999). I argue that the livelihoods perspectives' emphasis on the term "resource access" as opposed to "resource ownership" is a progressive move that has the potential to refocus on women as individuals and gender relations, as well as increasing the focus on the different kinds of claims that people have to assets and opportunities and how these are acquired and sustained (ibid).

Figure 2.2: Songo Songo livelihoods strategies using the rural livelihoods approach



Source: Modified from the basic livelihood framework (Ellis, 2000b)

In Figure 2.2, above, the rural livelihood approach is explained in the context of Songo Songo livelihoods based on Scoones (1998), Carney (1999) and Ellis (2000), whose key emphases include:

Assets: in this case, the human capital of Songo Songo men and women, their gender relations, marital status and livelihoods strategies. Natural capital here refers to the marine and land-based resources – with greater emphasis on the former – that are a main source of Songo Songo livelihoods.

Access: access to marine resources influenced by temporality, which refers to the lunar tides and trade winds, the fluctuation of seaweed farming activities with the seasons and weather changes; and tools such as boats used for fishing and octopus collecting that affect how men and women access marine resources on Songo Songo Island.

Activities: various land and marine based activities on which the Songo Songo islanders depend for their livelihoods such as fishing, octopus collecting and seaweed farming, and others which have resulted to changes in the way men and women engage in these activities.

Related outcomes: the result of using livelihood strategies such as income, savings and the tools used to access marine resources on Songo Songo Island.

Intra-household gender relations on the island influence access to marine resources and how related livelihood activity outcomes are managed in households.

The framework draws on rural livelihood principles to reveal how assets, access, activities, related outcome and intra-household gender relations affect Songo Songo livelihood strategies. It provides a useful analytical tool for understanding how the above help or hinder in Songo Songo livelihoods, and helps to provide a holistic view of how Songo Songo men and women connect with the larger economic and institutional context, such as the international seaweed and octopus markets, oil and gas exploration and gas processing.

Although livelihoods approaches have caught the attention of a variety of researchers and a range of organisations, partly because they are people-centred and readily fit with the poverty reduction and participatory approach that are considered essential elements of development interventions, gender concerns are not always fully analysed and addressed.

2.3 Gendered Access

In this section I discuss the theoretical construct of the thesis dealing with gendered access to the marine resources that affect rural livelihoods. It commences by looking at feminist political ecology and then at the theory of access, setting out the contextual basis for the

analysis of gendered access to marine resources and intra-household gender relations, as affected by women's income.

2.3.1 Feminist Political Ecology

Feminist political ecology is an analytical approach that describes gendered relationships in resource access and control in relation to social interactions; how these relationships influence ecological change and prospects for sustainable development (Rocheleau et al., 1996); and how class and gender inequalities relate to environmental change and conflict (Bryant & Bailey, 1997). It derives theory from practical experience, avoiding the pitfalls of maintaining a strict distinction between theory and practice. It links ecological perspectives with the analysis of economic and political power, and with local policy and action in (Rocheleau et al., 1996):

> *Feminist political ecology treats gender as a critical variable in shaping resource access and control, interacting with class, caste, race, culture, and ethnicity to shape processes of ecological change, the struggle of men and women to sustain ecologically viable livelihoods and the prospects of any community for sustainable development*. (*Rocheleau et al., 1996:4)*

I use this analytical framework to bring a feminist perspective to political ecology, recognising the interconnectedness of and the significance of gender and power relations in decision-making about the environment. It analyses the powerful essential structures that operate to the advantage of certain classes and groups, both locally and across international boundaries, focussing on how specific ecological locations and livelihood systems are linked into the national and global environmental, economic and political systems that form, enable and limit constraints and opportunities at the local level (Rocheleau et al., 1996).

Feminist political ecology conceptualises gender-environment relations, contributing to the use of the gender and development (GAD) approach to environmental questions by drawing further attention to the nature of gendered understanding, the link between cultural and resource use practices and the significance of the macro context (Green et al., 1998). It is common to find that while men specialise in livelihoods activities, women pursue integrative roles in economic activities and resource management (ibid).

Gendered structured positions are both a cause and the consequence of gendered identities, ideologies and practice, and pose important theoretical questions. The causes are related to economic variables, to colonialism and to material patterns of change foisted on

the South by the North (Rocheleau et al., 1996). Other causes of gendered structural positions are socially constructed. Whatever the cause, the outcome is an uneven power relationship which usually disadvantages women (ibid).

GAD perspectives shift the focus from gender roles to gender relations. They emphasise that not only activities but also relations of tenure and property and control over resources, products and decision-making shape people's environmental interests and opportunities (Green et al., 1998). Power relations and bargaining processes in social institutions such as marriage affect resource use decisions, with women's environmentally-related rights and responsibilities almost always contingent on kin and household arrangements. In consequence, individual women's resource positions vary according to their social position (Thomas-Slayter & Rocheleau 1995).

Feminist political ecology, initiated by Rocheleau et al. in 1996, attempts to determine the locus of power in societies by identifying patriarchal structures and exploring "the ways in which environmental concerns are traced through gender roles, knowledge and practices" (Peet and Watts 2004: 15); and highlights the environmental complications that women deal with in a variety of settings. Some of these circumstances, as Rocheleau et al. (1996) point out:

> *...carry a disproportionate share of responsibilities for resource procurement and environmental maintenance and yet they have very limited formal rights (and limited political and economic means) to determine the future of resource availability and environmental quality" (*ibid: 13).

Bryant (1997) explains how feminist researchers such as Agarwal (1992: 156) found that the social marginality of women in male-dominated or "patriarchal" societies is reflected in a dependency on environmental resources. For example, in poor communities in less-developed countries women are often responsible for gathering fuel wood or tending family food plots. Since these resources are often also exploited by men – for example, through logging activities – the ensuing depletion of trees only exacerbates the poor status of women. This analysis of gender norms and their implications for varied political and environmental interactions has provided political ecology with a wealth of information regarding how environmental issues and crises are handled (Bryant 1997).

Another key conceptual emphasis in political ecology is traditional ecological, or indigenous, knowledge (Rocheleau et al 1996). This method of understanding human interactions with the environment is particularly beneficial. It is short-sighted for studies to neglect the utility of

local knowledge, which can provide insightful information with regard to the use of land and the rationale for the methods used in its cultivation. As Bryant and Bailey (1997: 161) point out:

> *The general point here is that indigenous knowledge usually reflects a detailed appreciation and understanding of local environmental resources by grassroots actors, and that such knowledge has often served as the basis for highly effective environmental management systems, allowing for simultaneous resource exploitation and conservation.*

Political ecology makes a conscientious effort to counter pre-existing studies that fail to take into account the perspectives of marginalised or excluded actors. Local environmental knowledge that includes these perspectives can provide insights into the "accuracy and practicality of local ecological practices, especially amongst traditional people practicing subsistence production" (Robbins 2004: 118). I use feminist political ecology to focus on resource access and control as dictated by gendered constructions of knowledge and the embeddedness of local gendered environmental struggles (Rocheleau et al, 1996; Schroeder, 1999) on Songo Songo Island.

2.3.2 Theory of Access

Access to resources such as forest and land is a key element shaping rural livelihood strategies and outcomes (Scoones 1998). Access is a crucial factor that constantly reshapes people's livelihood portfolios. In a livelihoods analysis, a focus on access highlights the different mechanisms that actors use to control and maintain power over particular resources or forms of capital. I use the theory of access to unravel the power struggles among Songo Songo Island marine resource users and identify the mechanisms by which seaweed farmers, octopus collectors and fishers gain and control access to marine resources.

In theorising access and how it is constituted and contested by people, I draw on Ribot and Peluso's (2003) theory of access to analyse "who actually benefits from things [...] and through what processes they are able to do so". In their theory of access, property rights indicate different types of socially-acknowledged claims to resources and form a subcategory of access, authorising their holder to use, manage and benefit from resources (Bromley 1991).

The legal or institutional framework thus conditions access by defining rights. In a legal context where customary normative and statutory systems exist side by side, claims based on customary law on the one hand and national legislation on the other may often conflict

(Benjaminsen and Lund, 2002; Leach et al 1999; Mearns, 1999). Furthermore they may be recognised differently by different social actors (Colchester 2008). I concur with Ribot and Peluso (2003) and Bebbington and Perreault (1999), who find that access is akin more to "a bundle of powers" that the individuals hold as a means by which they can gain, control and maintain resources. Ribot and Peluso (2003: 54) explain:

> *Different people and institutions hold and can draw on different "bundles of power" located and constituted within "webs of powers" made up of these strands. People and institutions are positioned differently in relation to resources at various historical moments and geographical scales. The strands thus shift and change over time, changing the nature of the power and forms of access to resources.*

In addition to rights, it is important to analyse the strategies used to claim or defend access to resources. These include existing social networks, conversational means and cooperative and non-cooperative ways of action (ibid). For instance, Songo Songo women give money to their husbands in exchange for permission to go to the reefs to collect octopus or to farm seaweed in the intertidal areas.

The bundle of power from which the individual can draw shifts over time and changes forms of access (ibid: 154). It is therefore more relevant to adopt a framework of analysis conceptualising the *ability* rather than the *right* to gain access. In other words, the rights model could have been forced on this situation, for instance by focusing on the materialisation of rights, but would not have tackled the main issues at play.

Ribot (1998) and Ribot and Peluso's (2003) theory of access is built upon this notion. The authors distinguish three social processes that regulate access: control of access, gaining access and maintaining access. It is a somewhat dichotomous model in which one actor (typically a state agency) deploys strategies to control access to a resource while the users of the resource deploy strategies to both gain and maintain their access to it. Ribot and Peluso define access as "the ability to derive benefits from things" (ibid. 153). In this context, rights are only one set of factors in a larger array of influences on the flow of benefits; numerous institutions, social and economic relations and strategies shape the distribution of benefits. Hence the analysis of access to benefits involves the study of (1) the nature and flow of benefits that can be derived from a particular resource, (2) the identification of the mechanisms by which actors gain, maintain and control benefit distribution, and (3) the power relations that underlie the access mechanisms.

This theory of access has a strong focus on de facto management of and control over natural resources. In a similar way, Mollinga, (2003) conceptualises the ability to gain or restrict access to water. In a wider sense this conceptualisation builds on the understanding of irrigation activities as practices, i.e. social action, by which actors strategically engage with one another in arenas (or domains) of interaction. These “water control practices” can be connected to what Ribot and Peluso (2003) call “access mechanisms”. The authors distinguish a whole range of such mechanisms, starting with rights-based mechanisms, which can be legal or illegal, and continuing with a long list of structural and relational mechanisms which include the role of technology, labour, knowledge, authority and social identity. In any situation the particular access strategies have to be empirically studied, but clearly they are of a heterogeneous nature as many conditions must be fulfilled in order to be able to use a resource to produce a benefit.

This study articulates, in very broad terms, some of the theoretical perspectives that are critical to developing better understanding and awareness of the social and power relations that govern access to, use of and control over marine resources in contexts where people’s perceptions and understanding are influenced and shaped by the interplay of the different social, cultural and economic dynamics that provide daily livelihoods. This involves understanding the differences and inequalities in local actors’ contexts and facilitating recognition of the social and gendered nature of technologies (in the sense of the tools used by both men and women), policies and interventions. It also seeks to understand social and power relations in the community and differences and inequalities regarding access to, control over and the benefits of marine resources. Communities such as that of the Songo Songo Islands are governed by social and power relations and various decision-making processes regarding ecosystem management and marine resource use. The potential for disadvantaged groups such as these to alter depends on bargaining power and political relations within the household, the community and the state.

2.4 Concepts of gender and intra-household relations

Household models have presented the household as a sharing, altruistic and cooperative body with a unitary utility and function (Ellis, 2000b). This perception denies the possibility of intra-household inequality, bargaining and conflict (Kabeer, 1994). Feminists criticise the unitary household model, arguing that the household is a permeable and variable structure that can be a site of negotiation, conflict and bargaining (ibid). This identification of the complex interplay of conflict and cooperation between individuals with separate preferences has led to a different approach known as collective as models of the household (Haddad et

al., 1997). Even though they are an advance on unitary models, collective models remain limited by the abstract nature of their formulation in economic terms (Harts, 1995).

Social norms and rules are not fixed, but adapt and change with the evolving circumstances that confront individuals in a wider social and economic context. This process involves the renegotiation and redefinition of social roles and allows women, in particular, a voice in redefining outcomes that is absent when the social relations of the household are treated as an unvarying backdrop to fixed bargaining rules (Kabeer, 1994). The bargaining approach to intra-household dynamics provides an excellent framework for analysis of the bargaining space. However, the space open for bargaining and negotiation between household members cannot be defined purely on the basis of individual assets; it must also take into consideration 'socially and historically specific views about the rights, responsibilities and needs of particular individuals (Moore 1994:87).

It has often been assumed that with access to financial resources, women's employment would lead to their empowerment (Kabeer, 1991). However, this link is not straightforward, as examples from Kenya and Bangladesh show: firstly, intra-household dynamics shape women's control over their income; and second, even when they do control it, this does not necessarily lead to a transformation of their subordinate status (ibid).

2.4.1 Sen's Cooperative Conflict Model

This section covers the theoretical construct of the part of my study that investigates the extent to which women's economic independence and dependence allow them to exercise influence in household negotiating processes. The previous discussion of the livelihoods approach and the theory of access set the background from which I analyse how household gender relations are affected by economic power.

The aim of my research is to understand how the rise and decline of seaweed farming has affected intra-household gender relations in Tanzania. This is achieved by understanding gendered power relations in the domestic sphere, examining how outcomes are shaped through the process of negotiation and exploring the factors involved in gender inequalities. To achieve this I use Sen's cooperative conflict model (Sen, 1985; 1989; 1990).

It is important to examine whether and how household members cooperate and share what they have with each other. According to Sen, gender relations in the household may be best

understood as cooperative conflict: that is, relationships are marked by some degree of conflict and competition as well as by a degree of shared cooperation (Sen, 1989; 1990).

Sen's model of gender and cooperative conflict seeks to understand the problems between men and women and discrimination within the household in terms of negotiation. Individuals often engage in intra-household negotiation from unequal bargaining positions (Sen, 1985; 1990). As Kabeer (1991) states, economic approaches to household analysis fall into two broad categories: those that consider the household a unit where altruistic decision-making takes place, and those that consider it a site of bargaining and conflict. The central concept of the unitary model, as formulated by Gary Becker in 1965, is the presence of an altruistic member of the household, by default male, who controls and manages resources (Harts, 1995; Haddad et al., 1997). The unitary view of the household is criticised by non-neoclassical economists and non-economists for treating the household as a black box (Kabeer, 1994). Furthermore, critics have argued that this concept of the household as a unitary mode subsumes all forms of inequalities and exploitation among household members (Sen, 1987; Kabeer, 1991).

Sen argues that within households there is ambiguity about who contributes what to household resources, who is entitled to what from these resources and what this means in terms of individuals' bargaining positions. In Sen's terminology these are perception biases, entitlement and legitimacy criteria and fallback positions respectively. To overcome these drawbacks of bargaining models, Sen developed the cooperative conflict model to analyse intra-household relations. The three key elements of his model are the breakdown well-being response, the perceived interest response and the perceived contribution response, which I discuss below.

The breakdown well-being response, or fallback position, is the status quo or the outcome when two individuals fail to cooperate. If, in a collusive solution, the breakdown position of one person is worse than before in terms of wellbeing, the outcome will be less favourable to that person. The breakdown wellbeing response consists of both perceived and actual or observed wellbeing (Sen, 1989; 1990).

The breakdown position gives the individual vulnerability or strength in the bargaining. If, in the case of a breakdown, one of the parties ends up in more vulnerable situation than previously, this will weaken that person's ability to secure a favourable outcome.

The breakdown response is a general qualitative property of cooperative conflict entirely in line with the rationale of Nash's approach to bargaining (1956, cited in Mc Elroy and Horney

1981). Others have extended the idea of bargaining power by bringing in the idea of “threat”, to wit, a person threatening the other with some harmful action if the bargaining were to fail. (see Sen, 1970: 120-1). A person who threatens to harm another if the bargaining should fail does so to no direct advantage to himself or herself (otherwise it would not be a threat but rather something s/he may do anyway, and is thus reflected in the breakdown position). While it is plausible to try to get bargaining advantage out of a threat during the process of bargaining, once the bargaining has failed the threatener has no obvious interest in carrying out the threat.

Perceived interest response is where one person tends to attach less value to his or her own well-being the cooperative solution will be less favourable to that person (Sen, 1989, 1990). In the perceived contribution response, one member of a household is seen as contributing more than another member towards the household resources, his or her bargaining power in negotiating an outcome that is favourable to him- or herself is perceived as legitimate and the solution is likely to be closer to his or her preferences (Sen, 1989, 1990).

Sen’s cooperative conflict model provides a wider framework for understanding intra-household gender relations than other bargaining models, and is particularly relevant to developing countries. He brings in the notion of different bases of power that coalesce in influencing the cooperation of subordinate household members.

Sen’s cooperative conflict model helps to understand intra-household gender relations in this research. Conflict between married men and women is unlike other conflict, as they live together and share concerns, experiences and acts characterised by social arrangements (Sen, 1990). The success of the household depends on the totality of various income activities and the purchasing of food materials and other items for the household. Household members face two problems simultaneously, cooperation and conflict, which Sen describes in terms of social arrangements. It is a combination that acknowledges the possibility of real conflicts of interest coexisting with socially-conditioned perceptions of harmony.

In his discussion of social arrangements, Sen (1990) brings out the important points that place women at a disadvantage and make them more vulnerable than men. These are mainly ambiguities related to production and reproduction, the gendered division of labour and paid and unpaid work. The productive processes of gainful activities in which more men than women are involved, at least in developing countries, are possible only if reproductive activities and the management of the home are taken care of by women. However, not only is women’s labour at home unremunerated but their contribution to commodity production goes unrecognised because of this narrow view of production

On production, earning and perceived contribution – which form part of intra-household gender relations in coastal communities in Tanzania – Sen (1990) argues that a person who works outside the home or otherwise produces income for a household holds greater negotiating power within the household because s/he commands more respect and is less dependent on other household members. This helps in understanding how income and seaweed farming activities have shaped the intra-household gender relations of seaweed farmers. The availability of outside employment is one means by which women achieve agency, which in turn strengthens their negotiating position, self-confidence and leadership capacity (Sen, 1990). This increased agency gives them a stronger bargaining position within the household, due to the experiences and skills they have gained outside the household. However, the employability of women is restricted for various reasons, including their reproductive role and the socially-constructed gender bias. The reproductive role, which includes unplanned births and childcare, overburdens women to the extent that they have less time to engage in productive activities outside the home. The socially-constructed gender bias determines what is appropriate work for men and for women and results in the exclusion of women from some productive activities. For example, the women of Songo Songo Island are not involved in fishing, which is considered the men's domain; even the women who collect octopus, which is not considered fishing, have to negotiate with men to take them to the reefs; and the majority of the women formally employed at the gas plant are from the mainland.[11]

In the next section I focus on power and gender ideology to establish the theoretical linkages between these concepts and the conjugal contract. Inequalities of power are discernible in different interpretations of the terms of the marital contract (Whitehead, 1981; Moore, 1994). This suggests that understanding power and gender ideologies is central to understanding gender relations.

2.4.2 The Conjugal Contract

Social constructs of gender give different powers to women and men to act out in their daily lives. Conjugal, familial and kinship systems, for instance, construct women as a subordinate gender, making them "less free to act as full subjects in relation to things and sometimes people" (Whitehead, 1984:189). The cultural practice of men exercising superiority in many Islamic countries is based on the ideology that women are their dependents and should be protected (Afshar and Agarwal, 1989).

[11] Security Company and other service providers at the gas plant employ few women, the majority of whom come from the mainland. Very few of the island women who work at the gas plant are single.

The insecurity of women that arises from their total dependence and fear of being censured by kin and the community and the threat of divorce influences them to internalise subordination in many instances. Sen's (1990) notion of the underdog accepting the legitimacy of the unequal order and becoming an implicit accomplice applies in this context. On Songo Songo Island divorce has been a power culturally entrusted to men alone,[12] entailing a weakening of women's bargaining position in comparison to men. Agarwal's (1997) analysis of the bargaining approach brings into focus how social norms that set limits to bargaining are incontestable as they draw legitimacy from religious beliefs. Women are particularly threatened when they are economically vulnerable and when their kinship ties and social support systems are eroded (ibid; Kabeer, 1994). With more women stretching the limits of dependence within their households, contradictions to the interdependence of power, agency and vulnerability emerge.

The conjugal contract describes "the terms on which husbands and wives exchange goods, income and services, including labour, within the household" (Whitehead, 1981: 93). The author qualifies her use of the term "exchange" by stating that it is used in a general sociological sense and not as a technical economic term. Whitehead suggests that the terms of the conjugal contract are influenced by features of the wider economy and considers power an aspect of gender relations (1981: 94). The crux of her argument is that a woman's entry into the labour market is influenced by her position in her household, and the structure of the labour market impacts upon relations between women and men in a household. While Whitehead establishes that inequalities of power between spouses emerge from their arrangements for resource allocation and distribution, she does not speculate on the factors that influence these asymmetric arrangements. Her emphasis falls upon the relations of production and the distributional features of intra-household relations, and suggests the need for more detailed research to establish "the link between the differential position of the genders with respect to relations of production, and the ability to influence disposal and distribution" (Whitehead 1981 114).

Whitehead's paper on the conjugal contract concept raises important issues that are relevant to my study on gender and intra-household relations. Gender ideology and cultural norms about appropriate roles for women and men, according to Whitehead (1981), are significant factors governing the distribution of household resources. Through empirical research in two different economies – traditional Kusasi households in North-eastern Ghana and commoditised one and two wage-earner households in Britain – Whitehead shows how

[12]Women need to ask men to give them a divorce in words or in writing. Although they can also opt out of marriage through Khula (women right to divorce), most do not take this option.

gender inequalities in the distribution and allocation of household resources prevail in them all. This, she argues, is due to the gendered division of labour and gender ideology, which, although different in the two economies, produce the same inequalities within the household, suggesting that household power relationships are indirect and complex.

Gender ideology includes the gender role expectations spouses have of each other which lead them to ascribe specific roles to each other. The childcare responsibilities that are part of women's reproductive role tend to remain their task despite the fact that they engage in paid labour outside their homes. Whitehead (1981) found that in situations where the wife earned as much from full-time waged labour as her husband, types of expenditure from income brought home by the wife were different from those of the husband. Whitehead states that these differences originate from classical stereotyped roles for women and men; when the male breadwinner role is threatened by his wife's equal income; his mode of dealing with that income reinstates him in his socially-ascribed role as the head of the household. Women in waged and non-waged labour are subject to a "powerful set of values" of which "the ideology of maternal altruism" is one (1981:112). By this, Whitehead (1981) refers to the way that women as mothers and wives prioritise their children's needs. The argument that the division of labour based on gender is effectively non-comparable and non-substitutable shows that women's effective access to household resources is dependent upon power relations between women and other members of the household, particularly their husband.

The conjugal contract concept therefore helps to explain in greater depth the conduct of marriage, and how partners' power is influenced by factors other than material resources. I suggest that intra-household bargaining power is significantly determined by non-material factors, or, as mentioned above, influenced by cultural resources that go beyond the cooperative conflict model based on perception biases as put forward by Amartya Sen (1990). I place more emphasis on the cultural dimension of the conjugal contract concept than Whitehead (1981) does in her empirical studies in North-eastern Ghana and Britain, to explore the relationship between economic independence and gendered power relations in the household.

In my opinion there are two important elements to the conjugal contract; one is a formal and partially legal aspect, and the other is an informal and normative aspect. The latter is rather implicit and concerns the expectations men and women have of their spouses. Some, but not all of the factors influencing the terms of the conjugal contract are inclusive of legal provisions. An important point to take into account here is that while legal provisions in the

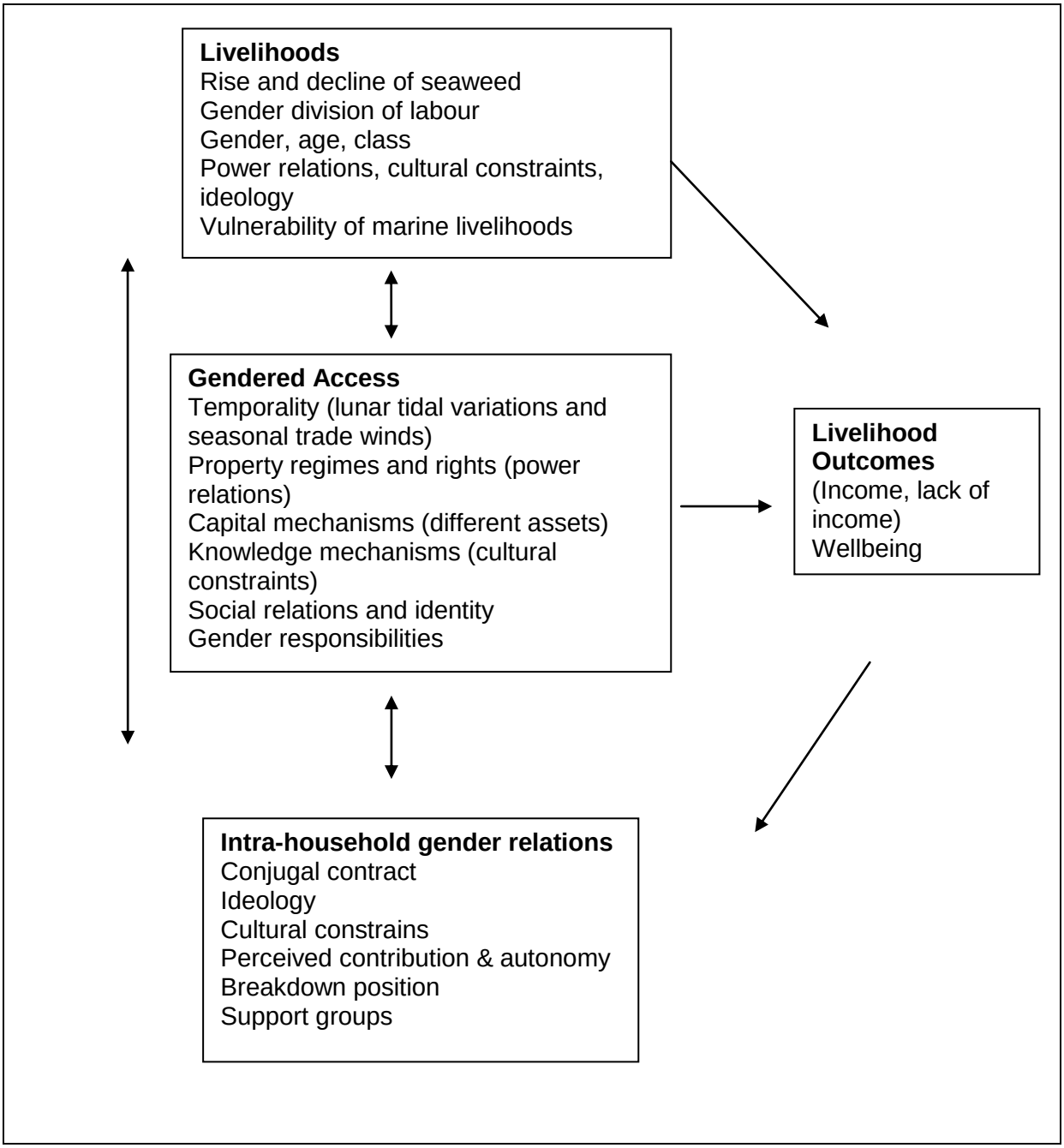
conjugal contract are equal for all women, normative practices subject women of different social status to different bargaining positions in their marital union. I therefore draw upon Sen's (1990) cooperative conflict model and Whitehead's (1981) conjugal contract concept to analyse my research data on marriage to give prominence to the impact of cultural norms and expectations, kinship, descent and status on women's experiences, particularly in marriage.

2.5 Theoretical and Conceptual Framework of the Study

This section draws theoretical and conceptual propositions of the thesis described from the different theories discussed in this chapter to form a conceptual framework for the thesis (see Figure 2.3). There is a strong connection between the livelihoods, gendered access and intra-household gender relations which are used in this thesis to analyse the data.

The Songo Songo men and women's livelihoods, gained from both marine- and land-based resources, affected by the rise and decline of seaweed farming, influenced by the gendered division of labour, power relations, cultural constraints and ideology have strong connections with how they access marine resources on the island. Their access to marine resources is also determined by intrahousehold gender relations, which in turn determine the livelihoods outcome. Married women on Songo Songo Island need their husbands' permission to access marine resources for their livelihoods, whether farming seaweed or collecting octopus. To gain this permission they give their income to their husbands as a form of unpaid loan, in this way creating or maintaining peace and harmony in their households so that they can continue to access marine resources for their livelihoods.

Figure 2.3: Conceptual Framework of the Study



The women were also sustaining their households at times when their husbands could not access the sea or marine resources for fishing for a week or more due to strong southerly trade winds. Their wives earning more income than they did threatened the men's masculinity to the extent that some are now happy that the seaweed has declined. However, this has created a big vacuum for the women, who have no alternative means of earning. It has forced them to shift their farms from one place to another, looking for areas around the island where seaweed can thrive. With natural gas well and processing plant areas closed

off for safety reasons, these women cannot move their seaweed farms beyond the closed off areas.

Although the oil and gas exploration and natural gas wells and processing plant in the Songo Songo archipelago are important for the national economy at the macro level, they have impacted on Songo Songo livelihoods at the micro level in terms of access to marine resources. In the Songo Songo south and Kiliwani areas, where women have seaweed farms and collect molluscs close to their homes and do not need a vessel to take them to the reefs, the area may be closed off in future by the ongoing gas and oil exploration, denying them access to their livelihoods.

2.6 Conclusion

This chapter has reviewed key terms in terms of access, rural and coastal livelihoods and gender and has explored various theories and models used in this research. The theories and models have been combined to derive a theoretical and conceptual framework (see Figure 2.3) which I use to understand the utilisation of marine resources and gender intra-household relations on Songo Songo Island. This framework also address the gap identified in these theories and models to answer my research question.

The application of a gendered perspective to livelihoods challenges the unitary model of the household. When considering intra-household dynamics such as gender, it becomes apparent that household members may not share common preferences and interests (Agarwal, 1998), and nor do men and women have the same ownership or control over assets (Ellis, 2000a). Ownership and control of land is a critical attribute of individual livelihood capabilities. Worldwide, women tend to have less ownership and control of assets, the most fundamental asset in many cases being land (Ellis, 2000b). Agarwal's (1994) view that women's struggle for their legitimate share of landed property may be the single most critical entry point for their empowerment, and is an example of control of physical capital that can be important for future income streams (Ellis, 2000a). Attempting to explore gender or masculinity and femininity means looking at the divergent trajectories and different life courses of men and women. Male and female Songo Songo household heads responded differently to questions regarding, for example, the main household economic activity; in several cases household members provided different answers, with household heads regarding their own livelihood activities, over which they had more control, as more important than those of others.

Women and men also differ in how they access marine resources for their livelihoods, decision making and their availability to participate in livelihood interventions. Marine fisheries are commonly held to be the domain of men, with analysis of the socio-economic structures of fishing reflecting a male-centred bias (Bennett, 2005; Thiessen et al., 1992; Williams, 2008), and the lack of gendered analysis of coastal livelihoods, including but not limited to fishing, can lead to mismanagement, as policy interventions will inevitably miss their target of creating sustainable livelihoods at the household and community level (Bennett, 2005). Therefore it is important to focus on the larger livelihood picture, which includes intra-household gender relations.

Chapter 3: Research Design and Methodology

3.0 Introduction

This research examines how the decline in seaweed farming has affected the household gender relations of seaweed farmers on Songo Songo Island. It is expected that each of the four research questions guiding the study will make a significant contribution to a broad range of issues related to livelihoods on Songo Songo Island and other rural coastal communities currently engaged in seaweed farming.

The answers to the research questions were derived from quantitative and qualitative data collected through household surveys, semi-structured interviews, focus group discussions, direct participant observations, key informant interviews and case studies, complemented by a wide-ranging analysis of a review of the literature on this subject. The data collection process was patterned on a well-defined philosophical framework conventionally known as a paradigm; this determined the choice of techniques adopted for the information collection process and its analysis. This section explains the positioning of this research within the philosophical research framework.

The chapter presents the overall research design and methodology as follows; the first and second sections describe the purposes of the research, the epistemological orientation and the preceding pilot study. The third and fourth sections provide information on the research design, sampling techniques, research instruments and procedures, while the fifth and six sections describe the research techniques and data processing and analysis. The last section presents the ethical considerations and limitations encountered in this research.

3.1 Epistemological Orientation

This study is about gendered access to natural resources, and examines how women and men negotiate terms in their households in relation to the temporal context of their livelihoods on Songo Songo Island. The adopted research strategy, as discussed in detail in Chapter 2, is social constructivism with a feminist qualitative approach that employs multiple research methods. Feminist epistemology studies situated knowledge (Haraway, 1989; Harding, 1991) focusing on experiences and differences that are essential to qualitative research on gender issues. I use a social constructivist (feminist qualitative ethnographic) technique whereby rather than just describing what is apparent from observation and interviews, the researcher goes further to elicit the “whys” and “wherefores”.

Given the fact that a critical ethnographic technique questions the classical ethnographic techniques' notion of value neutrality, this research has sought to move away from the fairly static position of a classical ethnographic observer to a more active analytical position, where terminology such as location of power, ideology, hegemony, alienation, domination, oppression, hierarchy, exploitation under capitalism, empowerment and transformation are important (Grbich 2007). In conceptualising gender and power differences, feminist epistemology has paved the way for in-depth analysis of women's experiences. Interviewing men too has allowed me to include their voices and experiences to obtain account of both genders, although the greater emphasis was on giving women the chance to voice their experiences.

I listened, observed, read and interpreted. However, my interpretations are coloured by my perceptions, values and beliefs about issues in rural reality due to my own experience and position. My own perceptions, values, beliefs and facts that I obtained from my research define what I consider "real" knowledge about the dynamic rural livelihoods on Songo Songo, affected by weather and lunar-influenced temporality and intra-household gender relations. I paid close attention to flexibility and reflexivity in an attempt to address biases in my analysis and interpretation of the research data.

According to Robson (2002), a researcher needs personal qualities such as an open, enquiring mind, and to be a good listener, sensitive, flexible, adaptive and open to contrary findings; and s/he should interpret information rather than just recording it. At a different level, the researcher needs to recognise his/her influence on the research process, which raises the issue of reflexivity (Robson 2002). I reflected on ways in which bias might filter into qualitative research and acknowledged that my own background and beliefs were relevant (Snape and Spencer, 2003). As a middle-class educated woman conducting research in a place where I had worked for ten years as community relations and community development manager, my presence, prior experience and value systems were potential influences on the research setting and on the research process in general. Many of the research targets perceived me as a threat, an opportunity and a nuisance. This possible conflict of interests was increased by my previous work with women in the area. I sought to employ a thorough reflexivity on the positionality, subjectivity and emotions involved in this research as a strategy for overcoming these challenges.

Exploration of the perception of rural women as vulnerable and weak is central to this study. I explore the complexities of intra-household negotiations without giving excessive weight to economic arguments to explain gender inequalities; it is not necessarily either a story of

poverty and despair or one of the privileged and the powerless. Capturing the dimensions of this argument requires making lived experiences visible and the examination of processes of negotiating power and economic vulnerability that go beyond positivist empirical research.

By locating the study in feminist discourse, I bring into focus the important themes of objectivity, situated knowledge, insider/outsider positionality, difference and experience[13] linked to the concept of objectivity. Haraway (1989: 583) suggests that by foregrounding the researcher and the researched, feminist researchers become more accountable: "Feminist objectivity is about limited location and situated knowledge, not about transcendence and splitting of subject and object. It allows us to become answerable for what we learn how to see." She states: "Situated knowledge is about communities, not isolated individuals". This research on the women of Songo Songo aims to challenge the norms that create agendas for rural women that are different to those of men; simultaneously, it presents an account of their day-to-day experiences which subjugate or at times empower island women. This approach is an effort to include reflexivity as an important aspect of the research.

In the broader sense, reflectivity refers to the capacity of the researcher to consider own values and the actions and decisions taken to generate data and write an account of the qualitative research undertaken (Seale, 1999; 2004). While the term "reflexivity" in the narrow sense may mean different things to different people, I choose to be reflexive in order to be critical of my own research and sensitive to the cultural dimension of the research setting, and how my presence could influence and at the same time maintain my position as a researcher.[14] This is tied in to awareness of the insider/outsider concerns that I discuss next.

My positionality as a female Tanzanian in a research setting on Songo Songo Island in Tanzania, with commonalities of gender, culture and religion with the researched, makes me an insider. However, the extent to which I can consider myself an insider needs further qualification because of "the hidden assumption that insider knowledge is unified, stable and unchanging" (Olesen, 2000: 227). Further, my position as a former employee of Songas[15] and a researcher from a western university makes me an outsider when it comes to

[13] Harding (1987) argues against a distinctive feminist method of inquiry, but argues that feminist-inspired biological and social science research has been demonstrated to be powerful due not only to the methods of inquiry but also to the important interconnections between epistemologies, methodologies and methods.
[14] For more discussion on the different meanings of reflexivity see Holliday (2002).
[15] Songas is a Tanzania-registered power-generating company engaged in power generation from natural gas and owns the gas processing plant on the island. As a Songas community development manager, I was in constant communication with the Songo Songo Island villagers from 1997 to 2007. When I arrived, I found that they already knew that I was studying in Europe and no longer worked for Songas

methodological issues of research. I was exploring aspects of intra-household gender relations of Songo Songo islanders of which I had no prior knowledge[16] – thus I consider myself an outsider in a place in which I had worked for ten years. My experience in the field suggests that the dual role of insider and outsider not only made conducting the research more complex but also compelled me to be more conscious of myself throughout the entire research process. As pointed out by Olesen (2000: 238), feminist qualitative research appears to adopt a self-conscious and sensitive approach in its formulation and conduct. I had to be more careful not to refer to the time when I was working for Songas or to impose my values on the researched while conducting interviews generating meaningful data.

The fact that both the researcher and the researched are consciously and subconsciously attempting to draw upon commonalities is an important aspect of qualitative research that largely rests on social interaction. This may sometimes bring negative results, but in my fieldwork I found it helpful in lessening inhibitions to meaningful conversation in research. During my previous work on Songo Songo Island I had made strong ties with an island family to the extent of being "adopted" as a daughter, a sister, an auntie and a person in whom some women could confide. This gave me certain advantages in my fieldwork relating to women as it enabled me to join in activities that were considered the women's domain, allowing me to observe through participation in relaxed informal gatherings. It helped to balance out the disparity between the rural women and my background as a former Songas employee[17] and a researcher from an urban area, and provided me with an access point from which to study Songo Songo livelihoods and gender intra-households relations closely. Furthermore, besides the relationships I had built previously I also earned other Songo Songo Islanders' trust during the course of my fieldwork.

Before I left for my studies I informed the Songo Songo people that I no longer worked for Songas. At the beginning of my research I held a public meeting with the islanders to inform them of my research and the research objectives and to answer all queries about it. I made clear to them that my research was part of my studies and had nothing to do with either

[16]The Environmental Impact Assessment and Social Impact Assessment studies that highlighted the impact of the Songo Songo gas-to-electricity project did not address the impacts on the livelihoods and intra-household gender relations.

[17]PanAfrican Energy my made it easier for to me be trusted by the islanders, as on the first day of my research and at my first interview they sent two security guards to harass me. The incident was witnessed by some islanders and helped islanders to be open about many issues, including their relationship with PanAfrican Energy. While the Songo Songo gas-to-electricity project is a public private partnership funded by the World Bank and shareholders both Government entities and Private investors formed Songas, the gas plant on Songo Songo Island is operated by PanAfrican Energy. I was never an employee of PanAfrican Energy. Although I informed both Songas and Pan African Energy about my research and got lifts from Songas to the island, I was told not to visit the gas plant or the camps where the workers lived

Songas or PanAfrican Energy, the company operating the gas plant on Songo Songo Island. My research status elicited certain expectations from the researched, who expected me to put their views to the bureaucrats on the mainland. As a researcher I was only able to get involved in matter related to education and health and did not want to become involved in local politics.

One of the positive aspects of being an insider was the benefit that arose from a shared language. Being able to communicate personally with the researched in Songo Songo without the use of an interpreter provided me with an opportunity to capitalise on perception and observation that gave me a rich understanding of what was being expressed.

I considered the issue of affinity and identity in this research, as there is an important distinction between the two as a basis for framing and pursuing research questions on gender, class and other dimensions of differences (Rocheleau, 1995). This is relevant to decisions about who does the counting, whose realities are counted and which social institutional context constitutes the sampled universe for a given group (ibid). There is also the issue of addressing men and women as both individuals and household members. Their affinities to their occupations and to their class, as opposed to their identities as men and women, were approached with care. Lastly, I considered the issue of affinity, as opposed to identity, for myself as a researcher and not as a woman (Rocheleau, 1995).

Power and language are implicit in social constructivism, and I addressed these issues in my research. Power in this context is the ability to make someone do something that is not in their own interest and to frame the terms of public discussion to the extent that those without power do not recognise their powerlessness (Bardhan & Ray 2002). One of the emerging issues in the course of this study was power relations between the researcher and the researched; among the respondents during the fieldwork, for example in the focus groups; between the men and women in households, where men dominated the discussion; and among men and women of different age groups, which led to my creating separate focus groups defined by age and gender. Power relations were also observed among stakeholders such as central government, investors in gas mining and processing, oil and gas explorers, policy makers, village government and seaweed buyers and farmers.

I have come to learn, as I know nothing

"*I am here to learn: I know nothing about your lives or ways of life and livelihoods."*

This was my guiding principle throughout the research. I realised that apart from working with the islanders for almost ten years, I knew nothing about their livelihoods or their vulnerability to stress and shocks. However, the islanders did not believe me when I confessed this to them, especially at times when my questions seemed foolish or childish to them. They expected me to know a lot about their livelihoods as I have been to school and I'am educated. After probing, and living their lives, doing the activities they do, they opened up and told me about their livelihoods, the temporality, stress and shocks they experience and their survival strategies. I found that the fishers loved to tell me their fishing stories, their trials and tribulations on the sea in different seasons, their triumph when they overcome the sea and their survival strategies for when the sea is no longer accessible due to the trade winds. In short, they told me how they master the sea and manage to survive.

The seaweed farmers were eager to tell me about how they walk with pride after selling their seaweed due to the discouragement they received from their fellow islanders when they started farming this new crop. They also spoke of the difficulties of seaweed farming and the rewards that came with selling their harvest and particularly with having their own income to use whenever they want and their sense of autonomy. They narrated how this income challenged their social relationships: for instance, whenever male partners felt threatened by their wives' newly-acquired financial freedom, the women bribed them from the same income to avoid household conflict. They spoke of the changes when the seaweed declined, which at times forced them to opt to collect octopus. All this was information worth listening to repeatedly in order to establish a consistent understanding of the livelihoods of this population and their intra-household gender relationships.

I understood the concepts of livelihoods, temporality, stress and shocks and the islanders' intra-household gender relations following further narration from the women who farmed seaweed and from those who did not. The majority of these research participants are now mostly involved in collecting octopus. Their narratives were instrumental in understanding the nature of their livelihoods and the immediate challenges such as price fluctuations, bureaucratic barriers and competing activities such as exploration for gas on the island. All the data on the experiences of the Songo Songo Island population informed me about the use of and access to marine resources and their impact on intra-household gender relations.

3.2 Target area of the study

The sampling rationale for Songo Songo as the study area was based on a set of factors, the first being the importance of marine resources in Tanzania. The area is Kilwa district,

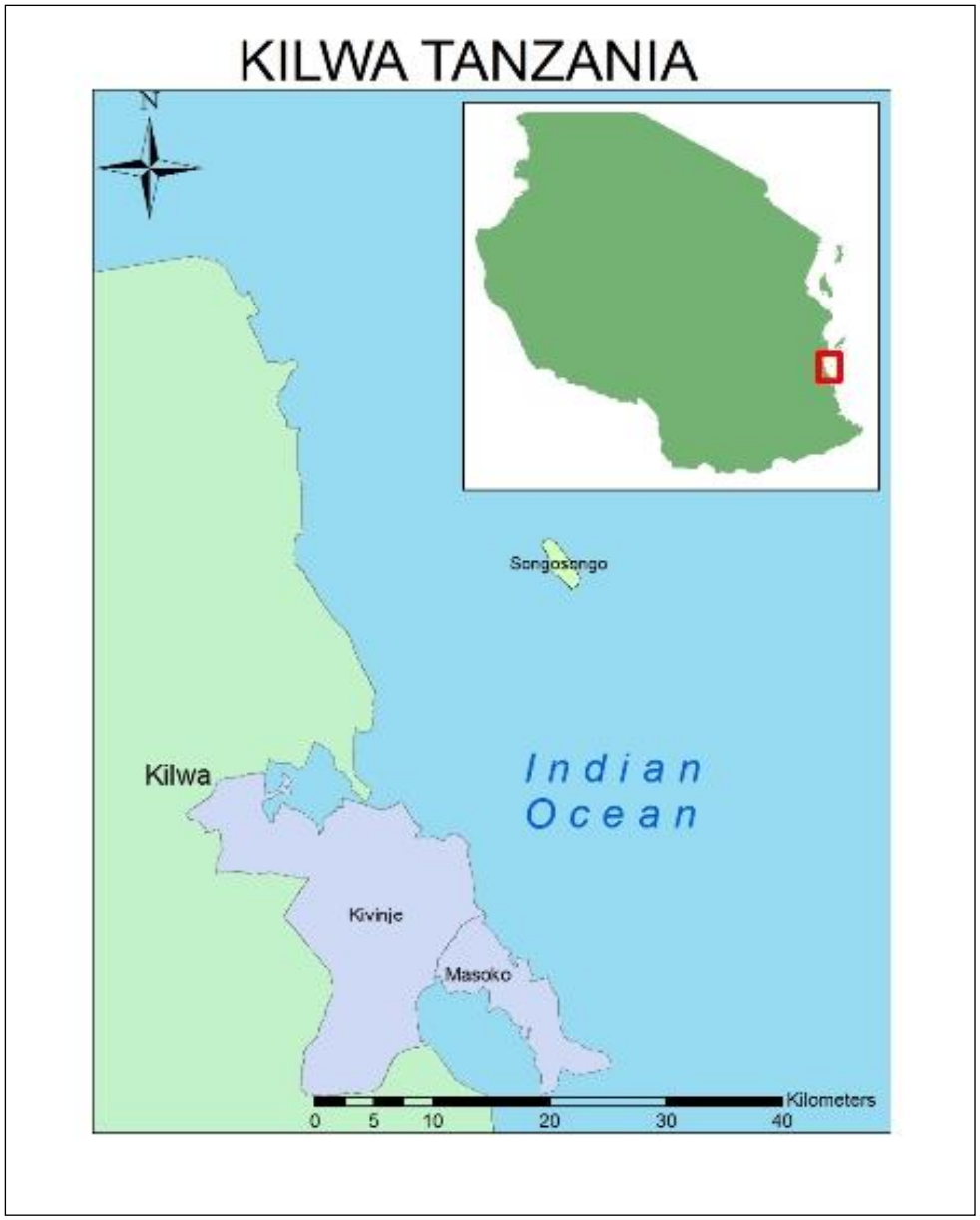
which has abundant marine fisheries and other resources such as natural gas. The bays of Rukira, Songo Songo archipelago, Rushungi and Kiswere are the most important fishing grounds, and Kivinje and Somanga are the biggest fish-landing stations (Mesaki 2005; WWF 2005). Kilwa is the only area of Tanzania's territorial waters in which fishers can still catch large fish (bream, grouper, parrotfish, snapper, rabbit fish, emperor fish, shark and rays) using shark nets with a 5- to 6-inch mesh.

Kilwa district is an important site for its coral reefs, which are found mostly around the Songo Songo archipelago (WWF, 2005). Another reason for conducting the research in this area is that it is one of the poorest regions of Tanzania, thus the level of dependency on natural resources is significant and there is little possibility that integrated coastal management (ICM) can be successful without alternative livelihoods such as seaweed farming. This area is among the best producers of seaweed in Tanzania, especially cottonii species, which fetch a high price. In 2003 alone the income from seaweed was about 84.8 million Tanzanian shillings and in 2004 it was 57.6 million Tanzanian shillings (Ward Office 2008).[18]

Kilwa is renowned for its coral island characteristics and is an area of Tanzania that has been under-researched; no socio-ecological study of this nature seeking to understand the impact of income from marine resource livelihoods such as seaweed farming on intra-household relations has ever been carried out there. This study therefore pioneers a socio-ecological understanding of coastal resource management in the area.

[18] The exchange rate in 2009 was 1$ = 1300+ TZS while in 2004 it was 1$ = -1000 TZS

Figure 3.1: Map of Kilwa and Songo Songo Island Tanzania



Source: Google maps

3.2.1 Songo Songo Village, Kilwa District

Songo Songo Island is located at 8º 30'S and 39º 30'E and is about 25 km northeast of Kilwa Kivinje and approximately 160 km from Dar es Salaam[19] (Songas 2001). The island is part of the Songo Songo archipelago, which consists of Songo Songo Island itself and the Fanjovi, Nyuni, Ukuza and Simaya islets (see Figure 5). All of these islands form Songo

[19]Dar es Salaam is the business capital of Tanzania, where most of the government and private head offices are located.

Songo village, which is administrated by Kilwa[20] District Authority, Lindi Region (Mesaki 2005). The archipelago constitutes Songo Songo ward in Pwani division. Kilwa is located at 8º 55'S and 40º 00'E and has an area of 13,920 km^2 and a coastline 150 km long.

The Songo Songo archipelago and associated reefs are rich in biodiversity and are home to threatened species such as sea turtles, which nest there (Darwall, 1996). There are abundant and diverse types of fish and other aquatic organisms of economic importance. These include finfish of various species, lobster, sea cucumber, cephalopods including octopus, squid and cuttlefish (WWF 2006). Pumbavu Islet (Dabali juu) and Funguni area on Songo Songo Island are good breeding and nesting sites for turtles, and, along with other nesting areas including the coastal strip between Kilwa and Lindi, have been identified as critical sites for the local turtle population (Darwall 1996, WWF 2006). There have also been reports of dugong sightings around the Songo Songo archipelago (WWF 2006).

The Songo Songo archipelago also includes the Songo Songo gas field, which holds estimated reserves of approximately one trillion cubic feet of gas (Songas, 2002). Natural gas from two onshore and three offshore gas wells is piped to gas-processing facilities on Songo Songo Island, where it is processed (see figure 3.2). After processing, the gas is transported through a 25 km submarine pipeline to the mainland coast and hence by a 205 km pipeline to Ubungo, Dar es Salaam, where it is used as a feedstock in the generation of electricity for the national grid. Gas is also sold to other industrial users.

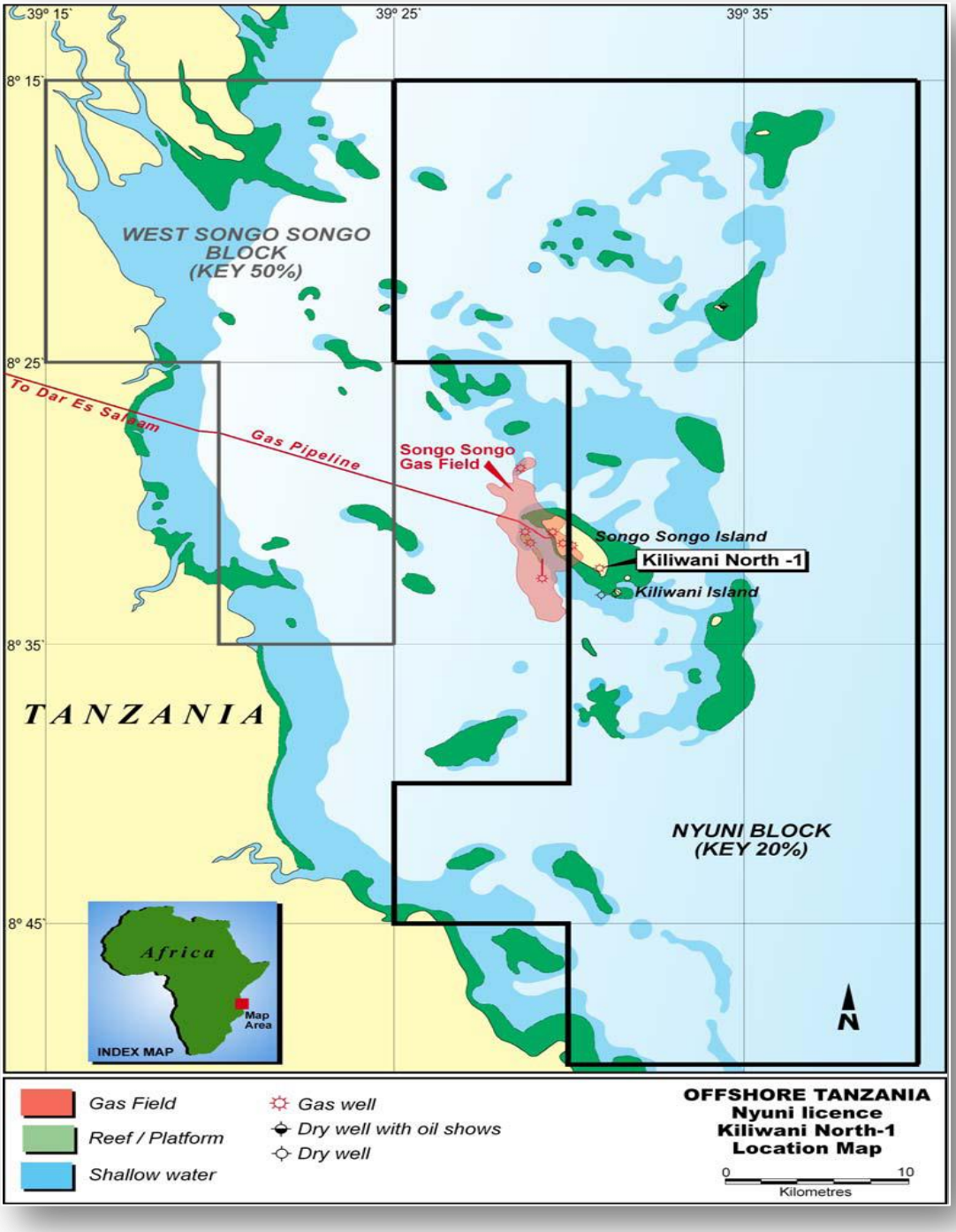
There is clear distinction between the inhabited northern part of Songo Songo Island, which is sandy, and the uninhabited rocky area in the south. The island is effectively divided into two parts, with the villagers living in one part and the gas plant, airstrip and gas wells in the other. The northeast and northwest are mainly inhabited, with the northeast favourable for octopus collecting and seaweed farming. Part of Funguni contains the Songo Songo Gas Plant, owned by Songas. Pembeni is a favourable ground for collecting octopus and farming seaweed. The ward and local government administrative offices are in the central part of the island at Kisuni. The presence of other marine resource users, including sea cucumber collectors, the natural gas processing plant and oil and gas exploration makes this area a good source of data.

The southeast trade wind prevails from April to September and the northeast trade wind from October to March, influencing Kilwa's climate. There are two rainy seasons in Kilwa district:

[20] Kilwa is one of the six districts in Lindi Region.

the light short season from November to January and the long heavy season from March to May, when the mean rainfall is 1,034 ml (Mesaki, 2005; Richmond & Mkenda, 2003).

Figure 3.2: Marine map showing Songo Songo archipelago on Indian Ocean



Source: Key Petroleum Limited

3.3 Research Design

The research design provides a framework for the collection and analysis of data. A selection of research design reflects a range of the research process, including the importance attached to expressing the causal connections between variables, and understanding behavior and the meaning of that behavior in a specific social context (Bryman, 2008). This study employs a qualitative research approach, mainly due to the need to explore the relationships between forms of social institutions and patterns of coastal resource utilisation. Qualitative methodology was also adopted due to the strength of the philosophy behind the methodology, which situates individuals in a socio-cultural context based on the belief that reality is complex and socially constructed (Bernard, 1995; Huberman and Miles, 1994; Mason 2002).

Songo Songo Island villagers face challenges from weather- and lunar-influenced temporality, livelihood difficulties and strategies, their interactions with the government and NGOs promoting conservation, and gender relations in their households. They also have to deal with national policies and laws governing resource use. This is reflected in how they access and use resources for their livelihoods. Denzin and Lincoln describe the benefit of using a qualitative approach in complex, naturalistic settings:

> *Qualitative research is situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible. These practices transform the world. 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.* (Denzin and Lincoln 2005: 32)

With the primary objective of my research an in-depth understanding of intra-household gender relations, I expected the qualitative approach to give me the accurate results I needed to understand the subject. While I prefer to use qualitative methods in my research, "quantitative methods investigate the social world in ways that emulate the scientific methods used in the natural sciences, with an emphasis on hypothesis testing, causal explanations, generalisation and prediction" (Snape and Spencer, 2003: 14).

3.3 .1 Pilot Study and Research Site Selection

I conducted a three-month pilot study from June 15 to September 15, 2008, with the aim of collecting secondary data, understanding the context and history of the research sites and interviewing key informants about the important issues affecting local livelihoods and community dynamics before I made a final decision as to my study area.

The pilot study also allowed me to collect secondary data and establish contacts with people and institutions that were working or had worked on coastal livelihoods projects in order to gain an understanding of the possible research sites. I met with various stakeholders from organisations such as Geoservices, WWF Tanzania and the Rufiji Mafia Kilwa Seascape Livelihoods Programme (RUMAKI), which is run by WWF and funded by the World Bank. I identified four seaweed farming areas (see Figure 3.3): Songo Songo, Mafia, Bagamoyo and Pangani. Discussion with the various stakeholders identified above and my site visits influenced my decision to select Songo Songo Island as my study area.

I visited the island after meetings with stakeholders and stayed in one of the houses in the village, having made prior arrangements about this. I took my research assistant with me for two reasons: Coastal Travel stipulates that it will only land at Songo Songo Island on the way to Kilwa Masoko if at least two passengers want to go there; and I wanted my research assistant to know my research aims from the beginning.

I carried out formal and informal interviews with seaweed farmers and other villagers from July to September 2009. In general, this process was successful. There was a clear understanding that I no longer had any connection with Songas.[21] Details of the interviews form part of the study findings. Only one of the targeted women research participants refused to be interviewed, despite having consented previously.[22] This did not make a significant contribution to data attrition.

[21] See footnote 3

[22] When I showed up for our appointment she aplogised that she could not talk to me then because she was very angry after her goat has been taken by one of her husband's relatives claiming that it was theirs.

Figure 3.3: Map of coast of Tanzania showing areas of seaweed farming

Source: Msuya 2005

The target areas for the pilot study included Mlingotini village in Bagamoyo district, where there are two seaweed farming groups with formal structures and officers including a chairperson, secretary and treasurer. These groups included both men and women. I investigated the type of seaweed grown and their methods of farming through informal interviews with local male and female seaweed farmers. The information gathered in Mlingotini included insights about income and intra-household relations that significantly informed my decision to base my case study on Songo Songo Island. Time and financial limitations prevented me visiting Pangani district, where Tanzania Coastal Management

Partnership (TCMP*)* has livelihood projects; however, I reviewed secondary data on villages in Pangani that also informed my decision on the study area.

The questions that guided my selection of the study area were as follows: are the villagers tired of researchers? What impact have other researchers had? Would it be worth doing my research there? What kind of data would I get from the area? Would my participants give me honest responses or just answer my questions to get rid of me? Would I get the same or different answers to those they had given other researchers?

Although seaweed is also farmed in other areas along the coast such as Mlingotini[23] village in Bagamoyo and some villages in Pangani district in Tanga region, my decision not to include these was largely based on their being very close to Dar es Salaam and thus over-researched due their accessibility; however few studies, and no socio-ecological studies similar to mine, have been based on Songo Songo Island because it is so remote. This study therefore pioneers a socio-ecological investigation of marine resource utilisation in the area.

The fact that I had been involved in a small project on seaweed farming on the island organised by Lead (www.lead.org) while training in leadership in development and the environment in 2005, which had inspired me to explore the problems I encountered in PhD research, and had spent ten years working in the research area between 1997 and 2007 for Songas responsible for community relations and development made my access to this area easier.

I established a link with TCMP that gave me access to their office and documentation during my fieldwork. TCMP is a joint initiative of the National Environment Management Council, University of Rhode Island and the United States Agency for International Development. I also had a link with the Department of Geography at the University of Dar es Salaam that supported me during my fieldwork and allowed me to access documents in the university library.

3.3.2 Research participants

A sample of 75 households was selected randomly from Songo Songo village for structured household interviews. Each household was represented by its head or, in his or her absence, any other household member, but mostly the spouse of the head. The selection of the household as a basic unit of the survey in this research was deliberate because

[23]Mlingotini is 60 km from Dar es Salaam and easily accessible by car.

seaweed farming is a common activity in almost every household in the study area. Moreover, households comprise extended families and therefore any adult in a household is aware of all matters pertaining to the household economy.

The research sample included female and male seaweed farmers and their spouses, if married. The sample also included participants who were not seaweed farmers and others who had abandoned seaweed farming for various reasons. Other participants included elderly island residents, key informants such as political leaders, religious leaders and natural resource officers, organisations operating in the study areas, and companies that buy seaweed.

These seventy-five households were selected randomly using the village register and PEPI[24] RANDOM, software that picked random numbers to create a list of 50 seaweed farmer and 25 non-seaweed farmer households. The exercise was carried out in the presence of selected members of the village government to prevent rumours and bias, and to offer transparency in the selection of households to participate in the research. After the random selection of the households, village leaders helped us to identify them. The transparency of the randomisation exercise reduced complaints from the villagers as to why only a few and not all households were selected and why neighbouring households were selected to participate in the research.

3.3.2.1 General Characteristics of the Respondents

This covers the age, sex ratio, marital status, educational level and size of the households of the sample population. Data on age are important in the description and analysis of other demographic data. Age data, for example, may be required to prepare current population estimates and projections, projections of household labour force, projections of requirements for schools, and for health, services, food, housing and transport. They also provide information about age and dependency ratios. Tabulations on age are essential in the computation of basic measures relating to the factors of labour supply and in the study of the problem of economic dependency (Shyrock and Siegel 1976:21).

According to the 2002 population and housing census, Songo Songo Island had a population of about 2,569, of which 1,515 were male and 1,054 were female (URT 2004). Key informants revealed that since the 1990s the number of people living in Songo Songo has been increasing due to immigration, mainly because of the attractions the island has to

[24] Programs for Epidemiologists; Abramson JH and Gahlinger PM (2001) Computer Programs for Epidemiologists: PEPI version 4.0. Salt Lake City: Sagebrush Press.

offer, including its lucrative fishing grounds and periodic employment opportunities at the gas plant. The majority of the immigrants attracted by the fishing sector are from the Makonde tribe of Mtwara, who stay on the island during the peak fishing season and may even marry to islanders. Others are Kojani from Pemba, who move in and out periodically. According to the village register used for the sampling, Songo Songo has a population of 5,700 in 750 households

Table 3.1: Age composition of the sample population

Age	Frequency	Percent of Total
21 - 25	2	2.6
26 – 30	11	14.7
31 – 35	8	10.7
36 – 40	13	17.3
41 – 45	14	18.7
46 – 50	11	14.7
51 - 55	7	9.3
56 - 60	6	8
60 - 65	3	4
Total	75	100

Table 3.1 indicates the age composition of the sample population. Only 4 per cent of the respondents are elderly dependants and the other 96 per cent are of working age. There are no children among the respondents as the study dealt with household heads or their partners, who participated on their behalf. In this study, 62.7 per cent of participants were male and 37.3 per cent female because the household heads are mostly male. The females included partners representing their head of household and a small percentage of female household heads. This being a gender study, this helps to identify different roles in households as well as household composition.

The number of members living in a household has a significant impact on the livelihood of that household. This impact can be either negative or positive, depending on the activities, income and age of the household members. A high age dependency ratio can put a strain on household labour; while if a number of household members can provide the labour required and contribute to livelihood activities as well this has a positive impact on their income. The majority of the sample households surveyed in the study area had four to six members.

Before starting the fieldwork, an informational meeting was held with the Kilwa District Executive Director's office at Kilwa Masoko to get his permission to work in his district and interview staff working in the marine resource sector. The meeting was also used to inform them of the objectives of the research and to collect any secondary data available from the district. A meeting was also held with Songo Songo Island village leaders (village government), attended by the village chairman, village executive officer and hamlets chairmen, to inform them of the research objectives and solicit information about the number of hamlets in the village. This information was used to randomly select the research sample in order to have an equal number of households from each hamlet. Arrangements and appointments for structured interviews were made with the assistance of the hamlet leaders. Stakeholders involved in seaweed farming in one way or another were identified as guidance on whom to interview according to the themes of this research.

3.4 Research Techniques

The research techniques used to collect primary and secondary data to answer my research questions are outlined in Table 3.2. They included secondary data collection, structured, semi-structured and unstructured interviews, participant observation and focus groups. I recruited two experienced researchers, Zaina Sheweji[25] and Zena Machinda,[26] as assistants for the first phase of the research collecting baseline data on Songo Songo livelihoods through structured interviews.

[25] Zaina Sheweji has a BA in Education and postgraduate diploma in Human Resources; she works at the Environmental Resources Consultancy as a researcher. She has worked on Songo Songo Island several times.
[26] Zena Machinda has an MA in Demography and a BA in Education, and has experience in qualitative research from previous research with the National Institute of Medical Research (NIMR), PhD students and WHO in rural areas of Tanzania, especially the southern part.

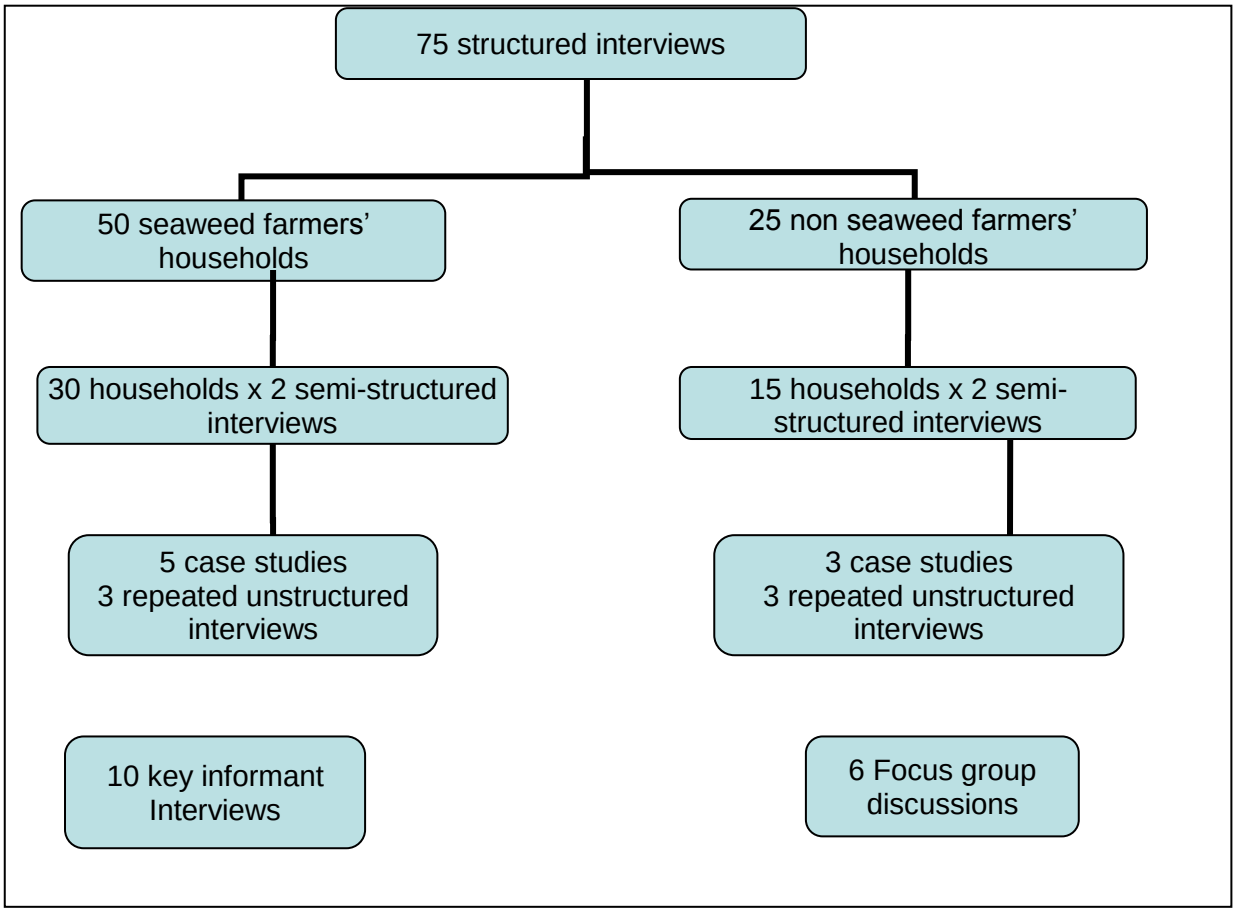
Table 3.2: Research Questions and Research Methods

Questions Methods	What are Songo Songo livelihood strategies and how does seaweed farming affect household income?	How do temporality and other factors affect gendered access to marine resources on Songo Songo Island?	How does the seaweed farmers' income affect household gender relations?	Has women's negotiating or bargaining power changed due to the decline in seaweed farming?
Secondary data	√	√		
Structured interview	√	√		
Semi-structured Interview		√	√	
Participant Observation	√	√		
Focus group	√	√	√	√
Case study interviews			√	√

3.4.1 Data collection

Data were collected in a number of different phases. The first phase was the pilot study from July to September 2008, which required a reconnaissance visit to the area, selection of the study area and observation of seaweed farming. It also involved collecting general information to enable the design of a sampling framework and data collection instruments. The second phase included a visit to the district authority to brief the district leaders about the objectives of the research and gather secondary data from various stakeholders at district level. The third phase involved two focus group discussions at village level and a survey of 75 randomly-selected households. The fourth phase of data collection was semi-structured interviews in 45 seaweed farmer and non-seaweed farmer households which were purposely selected from the 75 randomly selected households. The fifth phase involved unstructured interviews in eight seaweed farmer and non-seaweed farmer households for the case study of household gender relations (see Figure 3.4). Final visits were made to gather new information and fill gaps identified during preliminary data analysis.

Figure 3.4: A summarised illustration of data collection



3.4.2 Structured Interviews

In the first phase of the research, 75 household heads or their representatives from households randomly selected from all the hamlets on Songo Songo Island were interviewed, and two focus groups conducted, to collect baseline data on all the households in my study. I conducted these structured interviews with the assistance of my two experienced research assistants and an island woman helped us to identify the households selected for the research.

Although the interviews were structured in the form of a survey with coded answers, much time was spent listening to respondents' concerns about the use of marine resources. The survey enabled me to identify the households I wanted to invite to participate in the second phase. The questions were framed to collect baseline data on all the households in my study, including demographic characteristics and general information about their livelihoods and other issues related to their daily activities. Questionnaires in English translated in Kiswahili were used to elicit this information. All data collected in this phase were coded and

entered in SPSS for initial analysis and the selection of the 45 households for semi-structured interviews.

3.4.3 Semi-structured Interviews

The research techniques included structured, semi-structured and unstructured interviews as outlined in Figure 3.4, above. Interviewing begins from the assumption that it is possible to examine social phenomena by asking people to talk and gathering knowledge by listening to and interpreting what they say and how they say it (Mason 2002). The main technique used in this study was the semi-structured interview, which allows in-depth exploration of different social actors' perspectives and positions (ibid).

The second phase of my data collection involved semi-structured interviews with 30 seaweed farmer and 15 non-seaweed farmer households purposely selected from the 75 original households. The interviews with seaweed farmers focused on the rise and decline of seaweed farming and intra-household gender relations, while those with non-seaweed farmers focused on their livelihoods and intra-household gender relations. Information on the effects of temporality and their livelihoods was solicited from both households.

In households with married couples, I interviewed the wife and husband separately; in the households of divorced and unmarried people I interviewed the head of the household and another member of the same household, for instance a mother and son, a sister and brother, or a mother and daughter. The semi-structured interviews were carried out in Kiswahili and were digitally recorded with the participants' consent. Most of the interviews took 10-75 minutes depending on the person interviewed. The recordings were later transcribed in Kiswahili to preserve the meaning and then translated into English for analysis. This was followed by unstructured interviews with eight case study households purposely selected from the semi structured interviews for their life stories.

Men and women were interviewed separately to fit in with the daily routines and convenience of the two genders in a household, as it was not easy to get both husband and wife at the same time. Sometimes it took up to seven days to interview the husband of a woman who had been interviewed previously, because fishers who use nets go out to the small islands for a week or more during the spring tides. However, in households where the husband fished using traps or hooks it was quite easy to get interviews in the evening or when they came back from the sea.

All the interviews were influenced by tidal variations and I had to wait for high tide, when the islanders return from fishing, collecting octopus and farming seaweed during the spring tides. Interviews started at around 2.30 pm, although this changed during the neap tides, when seaweed farmers and women collecting octopus do not go to sea but spend most of their time doing household chores or collecting firewood in the bush. The islanders use the Islamic calendar to determine timing of the lunar tidal variations.

A guide to the semi-structured interview was prepared for each key informant group according to the type of data I wanted to solicit from them. The key informants were:

1. village leaders (village chairman or village executive officer)
2. influential village elders
3. influential women in the village (*kungwi/somo,* overseer of ritual activities)
4. seaweed farmers' group leaders
5. men of 18-35 years representing youth
6. a fishery officer
7. a head schoolteacher
8. seaweed buyers
9. representatives of other natural resource users in the village

I carried out all 45 household and key informant semi-structured interviews myself because I wanted to avoid the bias of my assistants' interpretation in my understanding of the results.

3.4.4 Case Studies

Five cases were purposely selected from the thirty seaweed farmer households and three from the fifteen non-seaweed farmer households for in-depth interviews on intra-household gender relations. These cases included married, widowed and divorced participants who stood out as they had opened up and shared their life histories. On identifying them from the semi-structured interviews, I immediately made appointments for a first in-depth interview. Two follow-up visits were made during the fieldwork period.

3.4.5 Participant Observation

Participant observation was used as an effective way of empirically observing the gaps between stated and actual behaviour (Bryman, 2008). I participated in various activities in the study area, such as seaweed-farming activities (planting, harvesting, drying and selling, depending on the season), which gave me opportunities for informal interviews and to

discuss aspects of the research questions with various participants in different settings. Other activities included visiting shops and markets (observing business transactions, prices of items), participating in ceremonial events and engaging with daily activities such as cooking, fetching water and firewood, going to the landing sites to buy fish and attending all events I was invited to.

My research assistants and I stayed in one of the village house, which was used by one of the VICOBA (Village Community Bank) group as their meeting point. I stayed in the same house throughout the fieldwork. The fact that I had a camera led to a number of invitations to weddings and other events as a photographer. I also attended funerals and 'spirit calling',[27] where women were possessed with spirits and where my camera had no place. I had to overcome my fears of the unknown world of spirits to attend these.

3.4.6 Focus Group Discussions

The focus group is a group interview about a particular, defined subject. It is based on interaction within a group and the joint creation of meaning (Bryman, 2008). In this research, focus group discussions were used to obtain background information on the study area, livelihood activities and gender relations. The discussion also included issues such as resource accessibility and availability, the rules governing resource use, the decline in seaweed farming and the effects of temporality on people's livelihoods. My observations from the seaweed farms were presented to the focus group for further discussion. Focus groups of women seaweed farmers and of non seaweed farmers were convened to discuss intra-household gender relations. With consent from the participants, the discussion was recorded and lengthy notes written up immediately after the group discussion.

The focus groups were conducted during the first phase and while the semi-structured interviews were proceeding, in order to capture gaps identified in my fieldwork exercise. The number of participants ranged from six to ten in each group, as identified below,

In the first phase, three focus group discussions were conducted with the following groups:

1. Male non-seaweed farmers aged 18-35

[27] Spirit calling is mostly done prior to the month of Ramadan, as it is believed that during Ramadan all spirits are locked up to allow Muslims to perform their fast, so it is kind of farewell ritual. Spirit calling is also performed when a woman or her child is sick, to ask the spirits about the source of the illness or any problems they face in the household.

2. Village leaders: village chairperson, village executive officer, village community development officer, school head teacher, village fisheries officer, village dispensary medical personnel, ward executive officer and ward councillor
3. Men and women of different age groups

Three more focus group discussions were conducted in the second phase of the data collection:

1. Female seaweed farmers aged 35 and over
2. Female seaweed farmers aged 18-35
3. Female non-seaweed farmers aged 18-35.
4. Six group discussions were conducted during the fieldwork.

3.4.7 Secondary Data Review

Various documents about coastal livelihoods, access to marine resources, and intra-household gender relations in Tanzania in particular and the rest of the world in general were reviewed. This is a continual process in this research, as archival data have the potential to facilitate reconstruction of the political, ecological and socio-economic position of the region outside current living memory (Jennings, 2006). Analysis of various documents such as government policy documents, the population census and household budget survey, socio-economic research reports, maps and unpublished documents from NGOs and research institutions yielded secondary data that provided insights into the rise and decline in seaweed farming and intra-household gender relations.

The secondary data collected included information on the study areas' current population size and distribution, geographical and administrative distribution at village, district and regional level; and other data on the types of natural resources available in coastal areas, the effects of temporality on livelihood activities and coping strategies, and weather and climatic data. The main research question asks how the rise and decline in seaweed farming affects intra-household gender relations on Songo Songo Island, and four sub-questions allowed further exploration using the methods indicated in Table 3.1, above.

3.5 Negotiating Access

Access to the study area was gained after obtaining a research permit from the authority responsible, the Tanzania Commission for Science and Technology (COSTECH); however, due to bureaucratic procedures the permit was obtained from the University of Dar es Salaam. The permit was then taken to the Lindi regional administrative secretary's office

and the Kilwa district authority (district executive director's office) for research notification purposes. The notification/introduction exercise continued at ward and village level to preclude suspicion concerning the research. Introductory letters remained at the above offices for reference purposes. It is important to use gatekeepers to gain entry and access to the field where research is conducted, and this was made easy for me by of my ten years working closely with Songo Songo Island villagers previously.

3.6 Data Processing and Analysis

I collected quantitative and qualitative data in the field through household surveys, semi-structured interviews at household level, and focus group discussions with various groups, direct observations on the island, key informant interviews and case studies. All the data were grouped and coded based on indicators and categories suited to answering the research questions. The qualitative data were tabulated for compilation in Microsoft Word after open coding for analysis. I used a qualitative approach to the analysis, interpreting the data through the identification and coding of themes, concepts, processes and contexts to develop explanations and arrive at a conclusion (Huberman and Miles, 1998). Data reduction involved selecting, focusing, abstracting and translating the data from written field notes and transcriptions of semi-structured and in-depth interviews. A simple spreadsheet was used to manage the analysis of the qualitative data by applying thematic coding to chunks of data, thereby enabling its reduction along thematic lines.

The quantitative data were processed and analyzed as descriptive statistics using SPSS software. The qualitative and quantitative data were integrated in the analysis to answer the research questions. While the quantitative analysis is presented in tables and described in detail, the qualitative data are presented as written text along with the quantitative data. This assisted in the cross-referencing and comparison of ideas across subsets and groups (Mason, 2002; Lewins and Silver 2006).

3.7 Ethical Issues and Limitations

I identified several ethical issues during the course of this research. The first is written versus verbal consent: in rural areas, signing a paper can raise concern or suspicion, therefore I asked my respondents for both verbal and written consent. I asked for written consent during the first phase of the research, when all the respondents signed to indicate their consent following a detailed explanation of the objectives, and asked for verbal consent prior to holding the semi-structured and unstructured interviews.

The study required a research permit from the authority legally responsible for the issuance of such permits in Tanzania, COSTECH, through the University of Dar es Salaam, which has been mandated to issue research permits. I adhered to the rules and regulations stipulated in the permit.

Household case studies, interviews and focus group discussions on the subject of gender relationships raised issues between men and women which at times stirred up unpleasant memories or events. At times this created tense moments with potential for conflict among the participants. I was very careful with regard to the sensitive nature of some lines of inquiry in interviews and group discussions, therefore, giving the participants the opportunity to withdraw when they felt uncomfortable. Sometimes I resorted to listening to both genders separately, allowing them considerable time to talk about intra-household gender relations or their grievances against other marine resources users on the island. Of my eight case studies, only one did not want her interviews recorded on the digital recorder. I honoured this wish and took no notes during interviews with her; my notes on her opinions are based on recollection of her responses written immediately after we parted.

At times I was faced with the dilemma of whether or not to pay research participants after a field data gathering events. I opted not to pay, lest it created an unsustainable precedent. For this reason, time spent with participants was minimised in order to allow them to participate in their daily income activities. In a situation where I took more of their time than I had expected, such as the focus group discussions, I shared meals or drinks with focus group members. However, this approach caused a dilemma when I went to collect octopus with some of the women and we spent almost five hours without catching anything. I wanted to give one of the women some money that day to help her to buy food for her household, but was worried that I would raise the expectation that I had money to pay them, and my finances were limited.

Ethical clearance for the research was obtained from the School of International Development at the University of East Anglia, whose risk assessment form I filled out before departing for the fieldwork and adhered to its guidelines during the fieldwork exercise.

Apart from ethical issues, I encountered several limitations. Besides limitations of time and resources, one of these was managing the expectations of community members and research participants, especially regarding the decline of the seaweed production, which raised hopes that after the research a project might follow. Although I made it clear that my

research was for academic purposes only, the islanders frequently asked if I would assist them in looking for ways to improve seaweed production, because the marine biologists who was studying the cause of the decline did not give feedback to the islanders.

The biggest limitation was transport costs to Songo Songo Island, which is accessible only by traditional dhow and by air. Although there is an airstrip there were no scheduled flights to Songo Songo Island due to the global economic crisis. The alternatives were to travel to Kilwa Masoko or Kilwa Kivinje and hire a boat to Songo Songo, wait for local dhows, or charter a flight to Songo Songo Island. After comparing the costs and safety measures, I decided to charter a small plane or hike a lift in other planes going there.

3.8 Conclusion

This chapter has described the research design and methodology employed to answer the research questions. The social constructivist approach adopted for the research justifies the relevance and use of qualitative and quantitative research techniques. These methods are suitable for analysing livelihoods, access to marine resources and intra-household gender relations, as proposed in the theoretical and conceptual frameworks. Structured and semi-structured interviews, direct observation and focus groups allowed me to include a variety of households, individuals and institutions in the research process and to collect data related to livelihoods, access to marine resources and their impact on intra-household gender relations. These data collected helped me to understand the socio-ecological dynamics of Songo Songo archipelago.

Chapter 4: Gendered livelihoods on Songo Songo Island

4.0 Introduction

This chapter explores Songo Songo livelihoods, particularly seaweed farming, to identify issues for further investigation in Chapters 5 and 6 in order to answer the main question of this thesis: how does the rise and decline in seaweed farming affect intra-household gender relations on Songo Songo Island? And the sub-questions: What are the livelihood options on Songo Songo? How does seaweed farming affect household income? This is premised on an understanding that the effect of seaweed farming in the household is dependent on the broader local livelihoods context.

As stated in Chapter 2, Ellis (2000b) points out that a livelihood comprises the assets (natural, physical, human, financial and social capital), the activities and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual or household (Scoones, 1998; Ellis, 2000b; Farrington et al., 2004). Following Ellis (2000: 19), I define livelihood as "a strategy or various ways in which households generate their incomes". It is important, however, to stress that alongside this theoretical underpinning is an awareness that "the means of securing livelihoods are usually dynamic and can be natural resource or non-natural resource based" (Allison, 2005; see also Allison 2004; Allison & Ellis 2001, Ellis, 2000b). The examination of gender in a livelihoods context in this chapter shows that varied tasks are divided along the lines of socially-constructed gender roles (Fuwa, 2004). According to FAO (2005), gender roles are often conditioned by household structure, access to resources and locally relevant factors including ecological conditions. As well as being socially constructed they are learned, dynamic, multi-faceted and influenced by class, age, ethnicity and religious practice (ibid).

Songo Songo provides an appropriate setting in which to study livelihoods in a context where the government, private developers and the islanders largely rely on a range of marine and non-marine resources (see Chapter 3). Section 4.1 provides evidence of types of livelihoods gathered from structured and semi-structured interviews with islanders and presented via their narratives. Section 4.2 gives general descriptions of livelihood strategies by gender. Section 4.3 gives an account of livelihood strategies based on women's marital status and men different categories of fishers. Section 4.4 examines seaweed farming, while section 4.5 illustrates the vulnerability of marine livelihoods on Songo Songo. The last section presents the conclusions to the chapter.

4.1 Livelihood activities on Songo Songo Island

In this section I show the range and combination of activities that Songo Songo Island men and women undertake to ensure their stable income, as detailed in Table 4.1. These activities are divided into marine-based and land-based livelihoods.

Note: The sum of households engaged in specific activities is greater than the total number of households surveyed, as households have more than one specific activity in their livelihood portfolio.

Table 4.1: Livelihood activities on Songo Songo Island

Marine based livelihoods	**Land based livelihoods**	**Households**	**Percentage**
Seaweed farming		54	72
Fishing		43	57
Octopus collection		39	52
Collection of shells		7	9.3
Fish processing and selling (dry)		2	2.6
	Making lime	1	1.3
	Farming on the mainland	8	10.6
	Vegetable gardening	25	33.3
	Coconut farming	26	34.6
	Renting rooms or land	4	5.3
	Keeping livestock	39	57
	Carpentry	2	2.6
	Masonry	3	4
	Tailoring	2	2.6
	Formal employment	10	13.3
	Selling snacks	11	14.6
	Handicrafts: weaving palm leaves	3	4
	Handicrafts: weaving mats and *makawa(food covers)*	3	4
	Selling top up vouchers	3	4
	Selling juice, ice cream	3	4
	Shop selling grocery	4	5.3
	Small kiosk selling small items	6	8
	Remittances	7	9.3
	Transport/ferrying people and goods	1	1.3
	Selling cooked food/restaurant	6	8
	Selling water	2	2.6
	Selling new clothes,	3	4
	Barbershop	1	1.3
Fish processing and selling (fry)		3	4
Renting out fishing vessel/*mashua*		2	2.6
Transporting octopus to mainland		1	1.3
Repairing/building boats		1	1.3

4.1.1 Marine-based livelihoods

Although seaweed farming is prevalent in many households on Songo Songo Island, the major occupation of Songo Songo men, as in other coastal communities, is artisanal fishery, which provides income and the main source of food (Richmond & Juma, 2011; Sosovele 2010; Ngusaru et al, 2001;). The average income obtained from fishing is about 100,000 TZS per household per month. Small-scale fishing is the main marine resource-based activity on Songo Songo Island in terms of the number of households involved, as the island is endowed with abundant and varied marine species (Richmond & Juma 2011). About 90 per cent of household heads are involved in fishing or fishing-related activities as their major economic activity (Sosovele 2010). Fishing is mostly undertaken using simple gear and vessels such as dugout and outrigger canoes, dhows, and small boats driven by sail or motor engine. The most common fishing gear includes traps, hook and line, nets, and spears.

Interviews with the District Natural Resource Department (DNRD) revealed that Songo Songo Island has landing stations for 79 registered fishing vessels and 305 fishers, of whom 246 were resident and 59 non-resident. There are also big commercial-interest groups operating in the fishing sector in Songo Songo and other parts of Kilwa district, which include non-residents who hire local fishers to fish for them, providing them with fishing gear and vessels plus some cash and foodstuffs, and then buy the catch at a fixed price which is normally set low to maximise profit. Due to their lack of proper fishing gear many islanders fish only for subsistence, selling a small amount to businessmen who then sell the fish in Kilwa town or as far away as Dar es Salaam. The most productive fishing grounds are to the north of the archipelago, where there are several hundred species of fauna (Darwall, et al 1996). However, no official data on quantities exist, even though the fisheries in the area contribute to Tanzania's export market (Sosovele 2010).

4.1.2 Land-based livelihoods

Of the 75 households surveyed, 39 engage in gardening and in keeping livestock. These play an important role as savings and security which can be sold as a last resort when in need of immediate income. Men usually keep cows, while women have goats and chickens, selling the cows when in need and keeping chickens for meals or to resolve small financial problems. This illustrates the socially-constructed nature of livelihood activity patterns.
Songo Songo islanders depend on imported food and other groceries from the mainland, which is 25 km away. There are a number of grocery shops selling food and other items. Of

the 75 households, 10 own small grocery shops and 9 run small restaurants selling cooked food such as rice, fish, tea and snacks, beans, fried cassava, buns, chapattis and porridge. Vegetables and fruit are mainly sold at the market close to the landing site. Other small-scale businesses sell cell-phone top-up vouchers, juices and ice cream, clothes, and water. Some households rent rooms to visitors and fishers from outside the island, rent land for visitors to build their house on, farm on the mainland, run guest houses and bars and carpentry, tailoring, boat repair and masonry business (see Table 4.1).

Gardening is the dominant form of agricultural activity and is carried out by women throughout the year. Twenty-five of the households interviewed have gardens of 0.25-0.5 acre, where they grow mainly vegetables, including pumpkins, cucumbers, and maize. These gardens depend entirely on rain, as the water from the Songo Songo caverns is brackish. Most households have a *Moringa Olifera* tree, locally known as *Mlonge*, whose leaves are used as a vegetable or relish, especially when fish are scarce. The women used to grow a variety of crops in relatively large areas, but this was abandoned because cattle now graze everywhere on the island. To overcome the nuisance of livestock destroying their plants, the islanders fence their gardens using coconut leaves, locally known as *makuti*.

A small number of households have farms on the mainland where they cultivate rice, cassava and millet and a few cashew nut trees, although most of the members of most of these households have now migrated to the island. I attended the end of a burial ceremony, known locally as *Karamu*, where women started talking about farming on the mainland and how women married to men on the mainland find it very hard to farm the land. When I asked them why this was, the response was they are used to the marine way of life, collecting octopus, fishing and collecting shells, and more recently farming seaweed.

The majority of islanders mix marine- with land-based activities such as selling snacks, handcrafts (mainly the women), and coconuts. One household generates income from transport services[28] and six from grocery shops and kiosks (*genge*) selling vegetables and small items. Four of the households surveyed reported receiving remittances from relatives or children living on the mainland as complementary income in the form of cash, food, clothes, and even mobile phone top-up vouchers via their phones, which they exchange for money.

[28] The prominent transporter I interviewed indicated that there are three main passenger vessels shuttling daily, when the weather permits, from Songo Songo Island to Somanga, Matapatapa and Kilwa Kivinje. These small vessels are owned by locals have limited passenger capacity. They mostly depend on wind power and only use their engines when there is no wind, to reduce costs.

The Songo Songo islanders use marine-sourced building materials in the construction of their houses. All 75 households used coral lime as a foundation, platform or perimeter wall for their houses, made from live or dead flat coral or whole small coral colonies collected by hand from the shallow sub-tidal areas. Making and selling coral lime is a lucrative business, especially when household incomes are high and construction is booming. The coral business did well when seaweed farming was on the rise because many people who earned money from the seaweed were constructing new houses or repairing their old ones.

Apart from livelihoods based on natural resources, some islanders are formally employed at the gas plant as surveillance boat operators and gas plant operators and their helpers. Their level of education influences this formal employment. For instance, islanders who have completed secondary education and have some form of technical education are employed as skilled workers. These are very few, and the majorities, who have completed only primary education, are mostly employed in semi-skilled or unskilled labour. Some of the islanders are employed by a catering company at the gas plant's workers' camp for work such as cooking and cleaning.

Apart from working in the gas plant in semi-skilled and skilled posts, islanders are employed as security guards at the gas plant, airstrip, camp and gas wells by the contracted security company. These are mostly men; a few women from the mainland are employed to provide cleaning services at various locations such as the gas processing plant and the village dispensary.

In this section I have indicated the range and combination of activities that Songo Songo men and women undertake for their livelihoods. All these activities show the livelihood portfolios of different households, which are accessed differently by men and women. In the next section I show how different livelihoods strategies are influenced by gender.

4.2 Livelihood strategies by gender

On Songo Songo Island, fishing is the main source of livelihood in 43 of the 75 households surveyed. Men and women engage in various combinations of fishing, seaweed farming, octopus collecting and other activities, as indicated in Table 4.2. The wives of the ten heads of household who are formally employed either farm seaweed or engage in other activities close to the house. None go to the reefs to collect octopus, which is mainly done by widows, divorced and single women and women whose husbands fish with hooks and lines or from

small vessels. The main livelihoods of widows and divorced or single female heads of households are seaweed farming and octopus collecting.

Table 4.2: Songo Songo livelihood activities by gender

Specific Livelihoods	**Men**	**Women**	**Joint**	**boy**	**girl**
Seaweed farming.		√			√
Fishing	√			√	
Octopus collection		√		√	
Collection of shells		√			√
Fish processing and selling dried fish	√		√		
Making lime	√			√	
Farming on the mainland		√			√
Vegetable gardening		√			
Coconuts growing	√	√			
Renting rooms or land	√		√		
Livestock keeping	√	√			
Carpentry	√			√	
Masonry	√				
Tailoring	√				
Formal employment	√			√	
Selling snacks		√			√
Fish processing and selling fried fish		√			
Handicrafts weaving palm leaves		√			√
Handicrafts mats, *makawa (food covers)*		√			√
Selling top up vouchers			√		
Selling juice, ice cream		√			
Grocery shop	√	√			
Small kiosk selling small items vegetables	√	√			
Remittances			√		
Transport/ferrying people and goods	√				
Selling cooked food/restaurant	√	√			
Selling water	√				
Selling new clothes, kanga, materials		√			
Barbershop					√
Renting out fishing vessel	√				
Transporting octopus to mainland	√				
Repairing/boat making	√				

Octopus collecting is one of the few marine resource-based activities for women on Songo Songo Island. This is an important livelihood activity and is conducted by both men and women. Before the introduction of the seaweed farming, women were the ones who engaged in collecting octopus, a livelihood passed down to them from their mothers, aunts and grandmothers. However, with the introduction of seaweed farming many women withdrew from octopus collecting to farm seaweed instead. With the decline of the seaweed, many went back to octopus collecting as their source of income and livelihood.

Octopi are caught in the inter-tidal reef flats and sub-tidal inner reefs, mainly during spring tides, for local and inland consumption and increasingly for export to European and Far Eastern markets. From my observations it is a very skilled activity; the collectors know exactly where the octopus hide on the reef. When I asked the women I was accompanying on their molluscs collecting expedition how they recognised the octopus holes, they responded that it is knowledge passed down over generations. Octopus are collected by either walking over the lower reaches of the intertidal reef flat or snorkelling along the reef edge, where they live in small holes (dens) and crevices, often concealed by small stones, rubble and pieces of shell. Once spotted, a slender stick or metal spear is inserted into the den and jerked up and down, causing the octopus to climb the stick. The octopus is then withdrawn and immediately turned inside out to remove the heart, or the spear is pushed through the beak into the brain to kill the animal. It is a tedious exercise which involves roaming around the reef seeking octopus holes. Another way to catch octopus is by diving in deep water. Using their traditional knowledge and customs, Songo Songo women collect octopus outside their breeding sites (Mbeyu seaweed farmer and octopus collector, Songo Songo 2009). Mbeyu claims that octopus numbers have declined in the last five years due to diving and other destructive fishing methods and a lack of rules governing the utilisation of this marine resource. *Octopus cyanea* is the primary species captured in tropical artisanal fisheries and generally comprises over 99% of the catch (Guard et al, 2000; Guard & Mgaya, 2002; Guard, 2003).

Fish-processing activities on the island involve salting fish and sun-drying them before transporting them to the mainland to sell. The processing is dominated by men, who do it in large quantities as they have more capital and are more mobile than women, who need their husbands' permission to travel. The few women involved in such business depend on their husbands to take their fish stock to the mainland, as in Maya's case.

Another type of fish-processing business is frying and selling fish on the island. This is a small-scale business requiring little capital and is mostly carried out by women close to their

compounds or selling at Funguni[29] market in the evening. Some men make the decisions about their wives' income from the salt fish, as in the case of Maya, who as a result stopped selling salt fish and concentrated on selling fried fish, which meant that she got her money instantly and had no worries about her money being "borrowed".

Fishers sell their stock while still at sea to exporters such as Tanpesca[30] and go back to the island without fish. From my observations at the landing sites, the women had to arrange beforehand if they wanted fish, competing with the middlemen, who buy the fish and transport them to Dar es Salaam, and the men who do fish processing on the island. The middlemen provide squid as bait to the fishers, who are then obliged to sell their stock to them.

The socially-constructed gender bias determines what is appropriate work for men and women, and results in the exclusion of women from some productive activities. For example, the women of Songo Songo are not involved in fishing, which is considered the men's domain, and even the women who do octopus collecting, which is not considered fishing, have to negotiate with men to take them to the reefs. The majority of the women [31]employed at the gas plant are from the mainland; Songo Songo Island men do not allow their wives to work there, as indicated by one of the young men in focus group:

> *Some men on other Islands may be very angry, and allow their wives to go to work at the plant, but for me, I won't allow my wife to do that because I don't trust the men there. I know that if she goes there she will go out with other men. So I don't allow her; I won't allow such a thing to happen. It is better if only I work, or if there is employment in the village office I will let her go, but she will not go to the camps and it will be much better if she doesn't get any work. (Madani, in young men's focus group, 2009)*

An Action Aid study found that it is particularly difficult for local women to be employed by the tourist industry in Zanzibar and are kept out of these jobs, partly because they risk being seen as prostitutes in the local community (Action Aid, 2004). Some men on Songo Songo restrict their wife's business movements, as indicated:

[29]However, women who sell fish at Funguni, such as Mariam, have been accused by their husband of being promiscuous due to their interaction with men in their business, as discussed in Chapter 6.
[30]Tanpesca buy fish as well as octopus from the island. Type of fish caught from the island include king fish, red snapper, octopus, calamari, tuna and *changu*, which all sell at the same price, 1000 TZS ($0.80) per kilogram.
[31]Security Company and other service providers at the gas plant employ a few women, the majority of whom come from the mainland. Very few island women working at the gas plant are unmarried.

Our religion has contributed to our way of life, as I do not give her permission to go ten feet from home; I do not allow her to do business far from home. I keep her at home. I will not allow her – our religion does not allow her to work far from home. I can open a small shop for her to sell vegetables at home but I do not allow her to go far as God does not allow it. (Daima, mixed focus group, 2009)

On Songo Songo Island there is a small local market where people sell fruit, vegetables and other foodstuffs such as coconuts, potatoes, and cassava. There are also small-scale food vending businesses serving the guesthouses where visitors and middlemen stay. Small shops selling groceries, a bar and a local club contribute to the village's business centre. The market is mostly dominated by women, with a few men from mainland areas such Kilwa, Somanga, Matapatapa and as far away as Lindi and Mtwara in Tanzania. A few Songo Songo women who sell fried fish at Funguni have encountered marital problems as they found themselves accused of being promiscuous:[32]

I will not allow my wife to go and work at the camp or gas plant, as men out there might ask her for a sexual relationship. Because they have money and are better resourced than I am, she might agree to have relations with other men. I do not believe that out of 100 men who might ask her she will not accept one of them. In order to avoid that I would rather have her stay at home than be employed at the gas plant, and if she insists on going to work at the plant I will divorce her. (Abdul, young men's focus group, 2009)

Apart from their husbands forbidding them to engage in certain livelihoods at the gas plant and other places on the island such as the airport, married women also need to ask permission before going to the reefs or intertidal areas, as discussed in Chapter 5. The only activity that they are allowed to undertake, and which is considered women's domain, is seaweed farming.

While before 1998, Songo Songo women were just doing handicrafts and their reproductive tasks in the vicinity of their household yards (Besha 2002), now they are involved in seaweed farming, octopus collecting and other activities such as selling cooked food. They started to earn income when single and living with their parents and continue to do so after marriage, as the cases of Maimuna and Maya illustrated in section 4.3.1, whose income was used on their parents' household expenditure and their own expenses. In the next subsection I give an account of the intra-household gender division of labour.

[32] See Chapter 6.

4.2.1 I wish I had a girl: Gendered division of labour

While at the household and community level, fishing, seaweed farming, octopus collecting and small-scale business and formal employment are all very important components of the productive labour profile, reproductive forms of labour form part of the larger livelihoods picture. Songo Songo women have both productive and reproductive responsibilities and workloads to attend to in their households. Having reproductive responsibilities gives women a different livelihood portfolio to that of men.

Regardless of women's livelihoods and their contribution to their household income, some gender issues became evident during my discussions with women and from direct observation of their activities during my fieldwork on Songo Songo Island. These issues are based on the gender division of labour and decision-making, which is socially-constructed, with some activities considered women's work and others, men's. According to Whitehead, (2001), the gender division of labour in reproductive and/or domestic work is very strong in Sub-Saharan Africa. Most estimates suggest that the average rural woman spends between 3.5 and 5 hours a day on tasks such as fetching water and fuel, preparing food and looking after the children, while the number of hours that men spend on similar tasks are few or negligible (Whitehead, 2001).

Women's other activities include taking care of their children and elderly relatives, fetching water and firewood and other tasks associated with taking care of their households; cooking, washing and preparing bath water for their husbands and children (see Table 4.3). Much of what society deems women's work is invisible (Sparr, 1994:6) and unpaid and is regarded as infinitely flexible and free. Men may perform some activities such as fetching water and collecting firewood, which are considered "women's activities", for business purposes. They fetch water for household use only when there is reason to do so, such as when the women in their households are away or sick and there is no one else to assist. However, they fetch water or collect firewood by bicycle, while women carry water and firewood on their heads.

Table 4.3: Songo Songo daily (intra-)household activities by gender

Activity	Women	Men	Girl	Boy
Fetching sea water for cleaning	v		v	
Sweeping the yard	v		v	
Cleaning inside the house (rooms)	v		v	
Cleaning the kitchen	v		v	
Washing dishes/ utensils	v		v	
Cooking	v		v	
Washing clothes	v		v	v
Fetching firewood	v		v	
Fetching potable water from the water points	v		v	
Fetching water from the caverns or wells	v		v	v
Fetching water to sell		v		v
Looking after children and the elderly	v		v	
Grinding grains and vegetables	v		v	
Fishing		v		v
Collecting shells	v		v	v
Seaweed farming and octopus collection	v		v	
Collecting firewood	v		v	
Purchasing items for the household such as staple foods and relish	v	v		
Purchasing items such as soap, oil, salt, onions, tomatoes, fruits, charcoal	v		v	v
Purchasing school items such as exercise books, pen, pencils and school uniforms	v	v	v	v
Providing income/money for purchasing of the above mentioned items	v	v		
Sailing a boat		v		
Building or repairing the house		v		v
Fish processing	v	v		
Small-scale business	v	v		
Masonry and carpentry		v		v
Making lime		v		
Looking after the livestock	v		v	

Note: These data do not show age and the intergenerational distribution of livelihood tasks.

Table 4.3 shows the clear gendered division of livelihood tasks in Songo Songo households. In households with children, women and girls perform more household tasks than men, as well as engaging in income-earning activities. Male children over 13 begin to fall into similar gender roles to those of their adult counterparts. The children's involvement in these activities is part of the socialisation process whereby boys do activities that are considered men's work while girls help their mothers with household chores in preparation for keeping their own houses when they grow up. Apart from illustrating the division of livelihood activities between men and women at the household level, Table 4.3 also makes the intra-household dynamics explicit.

Prior to the construction of the gas plant, the source of water was a cavern known locally as *Panga*, whose water is brackish. With the construction and operation of the gas plant, drinking water is desalinated and transported through pipes to a main tank and then distributed to various points in the village. Water for other uses such as washing and cleaning is fetched from the cavern. My hostess had a rainwater-harvesting system for washing and bathing and claimed that she had not been to the cavern for a long time. Since her children were away at school, her share of potable water was enough for cooking and some other uses. She fetched water from the ocean to clean her toilet.

Figure 4.1: Fetching water at the water point, Songo Songo Island

Fetching water is women's work, but men fetch water from the cavern and carry it on their bicycles to sell in the village to people who need it for their daily consumption. Female seaweed farmers also buy water from water vendors for household use. Some vendors take water from the water point and transport it to other islets which are also part of the village

and are entitled to drinking water from the island. They sell the water at 700 TZS per 20-litre bucket. At the water point the villagers pay 20 TZS for a 20-litre bucket. As we waited our turn to collect water at the water point, the women discussed various issues such as their seaweed farming and their daily lives.[33]

During my fieldwork period, on our way back from the seaweed farms I observed women carrying dried seaweed[34] to their houses. On the way some also collected firewood. One of the women in the group started telling us about her experience the previous day when she had been so hungry and tired that she felt sick. Before cooking dinner she had to prepare some porridge to eat to gain strength to continue with the house chores. She described how when she arrived home she found her husband and her sons watching television. “I wish I had a daughter; I could have asked her to cook dinner and I would have rested or even taken a nap, but there are only boys in my house”. She described how as soon as the porridge was ready her husband and sons wanted it and she had no alternative but to give it to them and continue cooking the dinner.

This is similar to what happens in other parts of Tanzania, as indicated by many studies (Caplan, 2000; Mascarenhas and Mbilinyi, 1983) that describe how women’s roles continue to expand beyond traditional domestic activities associated with farm and family into the realm of income-generating activities such as the collection and sale of natural resources, casual labour, and petty business.

4.3 Songo Songo household livelihood strategies

As discussed in Chapter 2, the household is the basic social and economic decision making unit in rural society (Beneria 1979: Locke and Okali 1999). It is essential to understand householders’ livelihood strategies to make sense of how they perceive opportunities for change. In this section, I illustrate how a few of the households on Songo Songo Island construct their livelihoods from my field observations and the research participants’ narratives.

[33] One day a woman told us that she was so tired that she could not wake up in the morning to take her porridge to the selling point, so she asked her husband to go and sell it for her and he ended up giving her only half of the money from the sale. She laughed the incident off with the other women, who rebuked her, saying that her laziness had cost her and that her husband had paid himself his wages. This incident is discussed further in Chapter 6.

[34] Dried seaweed is lighter than when harvested and wet, so it is normally dried close to the intertidal areas to make it easier to take home, where it is packed and sent to the selling point.

4.3.1 Women's livelihood strategies

Marital status is an important variable in this research, as one of the components studied here is intra-household gender relations. According to my findings, the majority of respondents (77.7%) were married; 2.7 per cent lived with a partner and those remaining were widows/widowers, divorced or single Women have a greater responsibility and workload, as they have both productive and reproductive roles to attend to.

4.3.1.1 Married women's livelihood strategies

Maimuna is a married mother of 5 children aged between 13 and 20. Two of her children have dropped out of school and help with the household livelihood activities that are fishing, octopus collecting, seaweed farming, frying fish and selling snacks. Maimuna went to a Madrasa school to study the Quran until she reached puberty. Although she had attended formal school and completed year 7, she claimed not to be sufficiently educated and considered herself s*ijasoma* (illiterate). Maimuna started going to the intertidal areas and reefs around the island as far as Imbi when she was young to collect octopus, a skill she had learned from her grandmother. At puberty, she moved back to Songo Songo Island and engaged in breaking quarries and stones, which she sold to the companies constructing the camps at the gas plant sites. The construction activities opened up new opportunities for Songo Songo women such as selling cooked food to the construction workers and renting rooms to people who came to the island seeking casual labour.

Women's self-reliance and ability to plan and decide on a livelihood strategy begins when they are young. However, based on Maimuna's narrative, one of the implications of this early attempt to be self-reliant is that they do not benefit from school; Maimuna was busy collecting octopus and never paid attention to her studies. She used the money from the octopus to buy clothes and other items. All she got from her parents was food, as she bought everything else she needed using her own income.

Maimuna stopped going to the reefs after her parents received a marriage proposal for her. She was kept in isolation from people who are not related to her inside her parents' house for two years (see Chapter 6) for socialisation and preparation for marriage. For young girls at this stage of life the parents, relatives, and fiancée provide their food, clothing, and other basic needs until the wedding day.

Livelihood strategies and decisions tend to change in households when the daughters are married, as it alters the dynamics in relation to decision-making and livelihood strategies. At times men attempt to impose their socially-constructed perceptions of intra-household

gender relations in a way that favours them while subjugating the women. This has obvious consequences for household gender relations.

Maimuna's husband hails from outside the island and learnt his fishing skills from his father-in-law, and collecting octopus from his wife. He falls into the *Ulimasi*[35] category of fishers. Maimuna continued to go the intertidal areas and the reefs even during her pregnancy; however, after giving birth she stopped, which significantly affected her income. As her husband's income was not sufficient to cater for the household needs, she started a fish-processing business. During the peak of the seaweed farming, Maimuna had her own seaweed farm, as did her husband, and between them they had about 200 to 300 seaweed ropes in their plots. They did not benefit much from the seaweed because of the marital conflict her income from it caused (see Chapter 6 for more detail). She earned 12,000 TZS[36] ($10) and 15,000 ($12.5) TZS selling octopus and 40,000 ($33) to 60,000 ($50) TZS selling seaweed per spring tide. At the time of this research interview their household income in January from seaweed and octopus collection was 7,500 and 10,000 TZS respectively. Her husband claimed to have made 4,000 TZS from fishing. Maimuna did not reveal her income from selling fried fish because of her previous experience with her income which was the source of her marital conflicts (see details in Chapter 6). Their household assets consisted of a bicycle, a television and a boat engine obtained from the RUMAKI[37] livelihood project,[38] which they rented out to people with boats. With the money they made they bought planks to make their own boat. They also had nine goats and savings with VICOBA.[39] They considered their household poor, which Maimuna attributed to the matrimonial conflict associated with her income.[40] She continued to sell fried fish and started to sell snacks in Funguni even when she was pregnant with her second child, as her husband's income was not enough to sustain them.

[35]This is a local coastal name given to the simplest type of fishing using lines and hooks and basket traps.
[36]The exchange rate in 2009 was approximately $1= 1200 TZS.
[37] Rufiji Mafia Kilwa Seascape Livelihood Programme, under WWF.
[38] Livelihood groups have been formed in Songo Songo Island through which they receive assets like boat engines and freezer from the RUMAKI project. Most of the groups consist of members of the same family.
[39]Village Community Banks, run by the villagers themselves.
[40]See Chapter 6. Mariam was beaten for earning income from her fish processing and other activities.

Figure 4.2: Songo Songo woman frying fish outside her house for sale

Maya has been married to Ali for nine years and their household comprises four people: Maya, her husband and their two children, who are too young to help with livelihood or household tasks. Their livelihood includes fishing, seaweed farming and fish processing to produce both salted dried fish and fried fish. On the day I interviewed Ali, Maya was busy cooking dinner and frying fish for sale at Funguni. However, when she was pregnant in the first year of her marriage she was not able to continue the same she had done prior to her pregnancy, affecting her household income. She had to depend on her husband's income from fishing, which was also not enough for the household expenses. She started drying and salting fish and frying fish as a livelihood strategy after she stopped breastfeeding. She continued with the fish-processing business, buying fish at the landing sites and processing them for sale on the island in the mornings and afternoons, while in the evening she dried *papa*[41] for sale on the mainland. Upon becoming pregnant with their second baby, Maya stopped fish processing, again resulting in less income for the household. She was once again unable to afford the household necessities. She discussed the situation with her husband and he advised her to change from frying to drying fish. She started buying dried *papa* and taking it to the mainland to places such as Newala and Tandahimba in the Mtwara region. At first she went with her husband to the market; however, after she gave birth to her second child her husband sent the fish to market on the mainland. From the dried fish business she could earn as much as 100,000 ($83) to 180,000 ($150) TZS. She found the

[41] A type of shark.

fried fish business more profitable than the dried fish business, although with dried fish she earns a lot of money at a time because she is able to control of her income. Their household assets comprise mobile phones, a TV, a radio, and a DVD/VCD player. They have ten goats and no savings, and consider their household about average (class status indicating sufficient income) compared to the majority of households in the community.

Mwanahariri was married to her first cousin before she reached puberty. She has three children and several grandchildren. She and her husband moved to Dar es Salaam in 1994 and returned to Songo Songo in 2000. Mwanahariri farms seaweed, collects octopus and sells snacks such as buns. She also makes juice and ice cream, as she has a big freezer[42] and a blender. Her husband is a fisherman and trades in shark fins. He has his own boat and nets and fishes with other fishers from Zanzibar. He is in the highest fisher category; and is thus better off than the rest of the fishers.

Tatu went to Madrasa as well as primary school, where she completed her standard 7 (basic education in Tanzania). This young woman was married to her cousin at a very young age. Her husband is a young man who has also completed his basic education and is formally employed at the gas plant as a security guard. Tatu sells snacks and has a small plot of seaweed close to where they live. She can see her plot easily, because their house is close to the beach. Their household assets consists of two goats, a bicycle, furniture, a TV, a DVD player and their own three-bedroom brick house with a thatched roof. They consider their household about average compared to others on the island.

Tatu stays at home looking after her young children (5 and 1 year old) as well as her younger siblings[43] until they are old enough to be looked after by her neighbour or her mother-in-law. She sells snacks to make her own income, and her husband has a stable monthly income of 150,000 TZS, equivalent to $130 per month. Her mother helps Tatu to look after her seaweed plot and sometimes looks after the children so she can tend the plot. However, Tatu cannot go to the reef or the far intertidal areas for octopus because of her young children. Selling snacks brings her very little income and she depends on the success of the seaweed farming, as the more income people make from seaweed, the more they spend on snacks.

42 About 70% of the Songo Songo Islanders use electricity generated from the Songas facilities and distributed to the island.

[43]Rehema mothers goes to the intertidal areas and leave their children with their daughters. Looking after young children is women's responsibility.

The narratives above show four married women with different livelihood strategies depending on their husbands' status. Maimuna is married to an *Ulimasi* category fisher and her livelihood activities are different from those of Mwanahariri, who is married to a *Tajiri*[44]and Maya, who is married to a fisher fishing for *Tajiri* and can afford to give her capital for her own business. However, Maya cannot afford to stay at home and take care of her young children like Tatu, whose husband has a stable monthly income. Regardless of whether they are married or not, Songo Songo women are not a homogenous group.

4.3.1.2 Divorced women's livelihood strategies

Mwajuma is divorced and lives in the new house that she built on her father's plot after the divorce, with her divorced daughter, her grandson, her two younger children and a niece. Her four-bedroom house is built of stones and lime with a thatched roof. She is a seaweed farmer, sells snacks and fried fish and has a small vegetable garden where she cultivated spinach, tomatoes, and cucumbers. Her daughter sells snacks to get her own income and supplement the household income. Apart from her own house, Mwajuma also owns a bicycle, a cow given to her by her uncle after the divorce, a goat, two pairs of gold earrings and a sewing machine, which she rents out, and earn a monthly income. She has savings in VICOBA. Before the seaweed farming, Mwajuma depended on her artistic work painting mats, making *makawa* (food coverings) and baskets, and embroidering flowers on bed sheets. After seaweed farming was introduced on the island, Mwajuma became fully involved in it. She used her income from the seaweed to open a small restaurant, and bought goats. The restaurant and goats were the source of conflict which ended in her divorce (see detail in Chapter 6). She considers herself better off than when she was married, because it is easy to engage in various activities and she controls her own income. She receives financial assistance from her kin whenever she needs it. She ranked her household about average, because she considers that her livelihood activities provide sufficiently for her household needs.

4.3.1.3 Widows' livelihood strategies

Mbeyu is a widow and the head of her household. She lives in her late husband's house with her six children, who are in standard 2 to secondary school. Her livelihoods are octopus collecting and seaweed farming. With the decline in seaweed farming she has only 20 ropes, which do not give her enough income. She is more engaged in octopus collecting and sometimes weaves *makuti* (palm leaves) for sale. She has no assets or savings in the form of cash or livestock. With the children studying at secondary school on the mainland,

[44] A *Tajiri* is a person with wealth of high status compared to others. He provides fishing vessels or sometimes nets as well. He chooses a captain to whom he entrusts his fishing assets.

sometimes she asks other people on the island for loans to pay for school necessities or even to buy food for her children, paying them back after selling octopus to the Tanpesca representative. Her livelihood depends mostly on collecting octopus, which is influenced by lunar tides and seasonality (see details of temporality and access to marine resources in Chapter 5).

Mbeyu and other women who abandoned octopus collecting for seaweed farming over the past five years were of the view that now seaweed farming is not doing well. Their reliable alternative (which does not require capital) is to go back to octopus collecting. According to Mbeyu, octopus collecting gives more income than seaweed on a daily basis, though on some days the collectors make nothing. She said that octopus have been commoditised and people prefer not to eat them, especially the big ones, because they can sell them to earn income which is then used to buy fish, especially fresh fish, and to meet other household needs.

Mbeyu's narrative, among other significant findings, indicates that there is a level of self-reliance and an intensive search for alternative livelihood strategies every time there is a fall in income to the point that the remaining income cannot sustain the household. There is sufficient evidence in the findings to suggest that women are capable of making key decisions on behalf of their households without relying on men for a subsidised income or for decision-making.

4.3.1.4 Single mothers' livelihood strategies

In every other society, the single parent phenomenon exists as the results of many diverse social factors. Based on this understanding, therefore, this study sought to broaden its exploration of the livelihood aspect to include this social group as a way of ascertaining whether there are major significant differences between this group and other groups. The study uses the narrative of Mwasiti, a single mother, to explore this particular objective.

Mwasiti is a single woman living with her three children, aged between 7 and 18, in her inherited house. Her young children go to school at the Songo Songo primary school and in the evening, attend Madrasa close to their home. Her household's livelihoods consist of seaweed farming and gleaning for shells and molluscs in the intertidal areas. Her 18-year-old son is involved in lime-making, making bricks for people to build their houses and sometimes fishing in the intertidal areas using lines and hooks. Mwasiti's inherited compound included a coconut farm where she harvested up to 100 coconuts at a time, three or four times per year.

Figure 4.3: Lime-making kiln

Coconut trees feature in the majority of homesteads on the island and have multiple uses on Songo Songo: the leaves are used as roofing and fencing materials, commonly known as *makuti,* woven by women and old men who sell them to middlemen. The coconut husks are used in the household as fuel. Coconut trees are a household asset used in times of need, when the owners sell their coconuts to get money to solve their problems. A coconut was sold for 250 TZS (US$0.20) at the time of the interview

Mwasiti also had a radio and 20 chickens. Although she considered her household worse off than others in the community, she is independent and could go to the reefs or intertidal areas without permission from anybody. Her income depends on the availability of marine products as well as on the buyers. She used to have 5 plots with 30 ropes in various locations on the island and farmed seaweed with the assistance of her sons and daughters. At the time of the interview she had only 2 plots with 20 ropes per plot, had harvested 100 kg of seaweed for 25,000 TZS and gleaned 6 kg of shells. With the decline of the seaweed she had no alternative but to search the intertidal area for shells, molluscs and sea cucumbers. This activity is mostly done during low tide; the shells are sold for 200 TZS per kg, while molluscs are either sold or used in the household. Sea cucumbers are collected but are not consumed in the area, nor in the country. They are readily picked up by men and women, as they are sessile animals with high value found in both intertidal and sub-tidal areas. They are collected when walking on the intertidal reef flat and by snorkelling or scuba diving in deeper water. Mwasiti sold her shells and sea cucumbers to a sea-cucumber processor and seller on the Island who started his business in 1999 after working with a Chinese trader in Kilwa Masoko. He is currently a collector and processor and assists in transporting them to Dar es Salaam, from where the Chinese trader exports them to China.

Mwasiti's narrative provides more evidence of how socially-constructed perceptions significantly influence women's potential to engage in progressive livelihoods. The narratives in this section have given an account of the various marine-based livelihoods of different women with diverse social characteristics.

4.3.2 Men's livelihood strategies: Fishers and fisher categories

Fishing is the main livelihood activity of the majority of men on the island and is categorised in term of the assets used (see Chapter 5 for details of how access to marine resources is influenced by the possession of different assets). Apart from fishing, Songo Songo men are also involved in land-based activities such as formal employment, small-scale business, boat repairs, carpentry and masonry, as described in sections 4.1 and 4.3. In this subsection I discuss the different categories of fishers because they were so evident during my research, as marine-related livelihoods involve a large number of households on Songo Songo Island.

Findings from Songo Songo Island indicate that one of the most prominent ways of defining livelihood strategies among the island population is by dividing them into categories distinguished by the type of fishing gear and number of fishermen in the team. This is also an indication of the level of accessibility to seed capital for the fishing business (livelihood strategies) (see Table 4.2). These different categories help to define their wealth ranking and status as well. Apart from this, they are affected differently by the shocks and stress they encounter.

Table 4.4: Range of fishing gear and fisher categories on Songo Songo Island

Category of fishing	**Fishing gear**	**Vessel**	**No. fishers in a group**	**No. households**
Ulimasi – walking on the reef	Hooks, lines and wickerwork fish trap	None	1	11
Fishing from small vessel owned by the fisher	Line and hook	Dugout canoe;	1	4
Fishing from small vessel owned by *Tajiri*	Line and hook	Dugout canoe	3 to 4	10
Fishing from vessel with engine owned by *Tajiri*	Gill nets	*Mashua*[@]	10 to 12	10
Fishing from family/kin-owned vessel	Gill nets	*Mashua*	4 to 5	4
Fishing from own vessel	Gill nets	Dhow	4 to 5 and 10 to 12	2

@ Cat-boat

The narrative in Box 4.1 explains the assets and capital required by the different categories of fishers that I encountered on Songo Songo Island. Box 4.1: Fishers' categories and assets

Box 4.1: Fishers' categories and assets

There is difference: fishing with lines and hooks you catch one fish at a time, and with nets you fish in bulk. I mean you can set your nets once and you might find yourself with a 50-kg sack of fish or even five, six, sacks of 50 kg each. Then the difference with line and hook fishing is, you might find yourself fishing from the morning when tide is low to the evening high tide, and if you get a sack of 50 kg of fish you consider yourself loved by God. However, most of the time it involves catching one fish at a time. Therefore collecting single fish using lines and hooks is not equal to fishing with nets.

People fish with lines and hooks due to poverty, their inability to buy fishing gear. Because when you have 3,000 TZS you can buy a line and a hook and you can go to the sea to fish. You cannot get nets for 3,000 TZS; to get nets for fishing, you need at least 100,000 TZS to start with. The main difference between the two types of fishing is capital. You can get lines starting from 2,000 TZS, and where do you go? To the ocean! The same as fishing with vessels and lines, you can go in a dugout canoe which can carry one, two or even three people. But with nets you cannot go fishing with boat that carries one, two, three people; you need a bigger boat. And the dugout canoe cannot carry three people and fishing nets at the same time – that's the difference.

(*Hamisi, a fisher who is currently working as a security guard)*

Maimuna's husband is a fisherman and octopus collector, and when the seaweed was on the rise he worked for Zascol[45] buying seaweed from the islanders. He is an Ulimasi fisher, who engages in the simplest type of fishing and does not have the capital to invest in fishing tools. He uses a line, which costs about 2,000 TZS.[46] It is called *Ulimasi*[47] as the fisher uses his own feet and cannot move from one place to another to look for fish, as explained by one of the fisher:

> *The lowest category of fishing is the one who in our coastal local language we call* Ulimasi *fishing.* Ulimasi *is the fisher who leave his house with his fishing lines only, he doesn't have a fishing vessel, and walks to the nearby reefs and fishes using his*

[45] One of the companies buying seaweed on Songo Songo Island
[46] Due to cultural constraints, women are not involved in fishing with hooks and lines or from vessels. I discuss this in Chapter 5 on gendered access to marine resources.
[47] Lowest category of fisher; walking by foot on the reefs fishing using hooks and lines and basket traps

feet: he just stands on the reef and throws his lines in the ocean. And with his low income, he is not capable of saying "I haven't got any fish from this site, so let me move to another site"; he stands at the same location whether he manages to catch fish or not. (Hamisi, fisher, 2009)

This type of fishing does not ensure a good catch, making it easy for Maimuna's husband to move from fishing to seaweed farming and octopus collecting. In a household where the head of household does *Ulimasi* fishing, the decline in seaweed farming had a bigger impact than in households with higher categories of fishers. The *Ulimasi* fishers participated more in seaweed farming than other types of fishers due to the nature of their fishing and lack of capital.

Saidi is a single young man who lives alone in his father's second house and has not yet accumulated any assets. He falls into the second fishing category; fishing with lines from a small vessel. He is mobile enough to be able to move from one fishing location to the next looking for fish. However, he cannot go far from the island because the vessel he uses is small and cannot endure in heavy seas.

Figure 4.4: Men fishing with hooks and lines from a small vessel near the island

The major difference between Ulimasi and this category is the ownership of fishing equipment and vessels. The fisher in the first category, who is the poorest of the fishers, owns his line and does not depend on anyone for capital or equipment (see Box 4.1). The fisher in the second category may own his own line, but the small canoe he uses may belong to him or to someone else, with whom he has to share his catch; for instance, Saidi and other fishermen who fished together in the canoe owned their lines but the vessel belonged

to a Tajiri, and their catch was divided into two parts, one for the fishermen and the other for the maintenance of the vessel, as indicated in this interview:

The vessel is owned by a Tajiri, who gives it to one person who he has appointed as a captain of the vessel, and the captain is the one who looks for people to work with him. We distribute income from fishing according to the daily situation. There is no fixed amount; for instance if we get 10,000 TZS we distribute it among the fishers first and decide whether to give the Tajiri 2,000 or 1,500 TZS. (Saidi, fisher, Songo Songo 2009)

Figure 4.5: Men fishing with nets near the island

Ali, who had no fishing boat or engine, fished with lines in a group with other fishers in a bigger fishing vessel in the third category: of fishing in a boat that may be mechanised. He and other fishers in this category were able to travel more than 10 miles from the island to fish and return to the island on the same day. Three or four fishers work together in this category, as one person alone cannot manage the vessel alone. Hamisi gave an account of this category:

> *The third category is the one who fishes with lines but with a bigger vessel, maybe even with an engine. This one can fish as far as 10 miles away and come back to sleep at Songo Songo. However with a canoe using a paddle you cannot go fishing at Nyuni islet and come back to sleep here. (Hamisi, fisher, 2009)*

On other occasion a vessel may have two fishers as crew, but this is very rare; normally it takes three to four fishers to man a vessel and fish at the same time. This type of fishing is more efficient than the Ulimasi and category two, as the fisher can go a long way to look for fish in the coral reefs outside the archipelago.

Abdallah is a fisher and trades in shark fins. He has his own boat and nets, and fishes with other fishers from Zanzibar. He is in the fourth and highest category of fishing. Fishers who use nets are better off than other fishers. They have capital and make good income fishing. They can move among the islets in the archipelago, or even beyond it, to look for fish. They may stay out at sea for a week or more. This category is divided in two groups. The first is fishers who own fishing nets but use a vessel owned by a Tajiri. These fishers give one part of the catch to the Tajiri for the maintenance of the vessel and the other part goes to the fishers. However, where the Tajiri provides both nets and vessel the fishers distribute the catch in three portions, one for the vessels, the second for net maintenance and the last for the fishers. Mwanahariri's husband, who is both a Tajiri and a fisher, gets three shares from the catch therefore gets a bigger share of the income than the fishers who works for him. This type of fishing is considered advanced. With the advantage of mobility and the use of nets they have a chance of catching more fish than the other types of fisher (Hassan, fisher Songo Songo 2009). They can sell their catch on the mainland or to the big traders from Dar es Salaam who wait at sea to buy the fish and put them in their freezers to sell at the fish market in Dar es Salaam (Rajabu. fisher, 2009).

In this section I have looked at fishing, the main male livelihood activity on the island, which is categorised in term of the assets used to access marine resources (see Chapter 5 for how access to marine resources is influenced by different assets). I have also looked at the livelihood strategies of single, divorced and widowed women. In the next section I discuss seaweed farming, as the income from seaweed is an important factor shaping intra-household gender relations, as I explain in detail in Chapter 6.

4.4 Seaweed farming on Songo Songo Island

Seaweed farming in Tanzania started in 1989 with two main species, namely *Eucheuma denticulatum* and *Kappaphycus alvarezii,* commercially known as *spinosum* and *cottonii* respectively (Bryceson 2002). Seaweed is locally called *Mwani*. In 1989, seaweed seedlings were imported to the Zanzibar Islands from the Philippines, and in 1994 and '95 the practice of farming the seaweed expanded to north Tanzania and the island of Mafia (Msuya 1996). Farming expanded in southern Tanzania in 1995/96 under the Rural Integrated Project Support (RIPS) Programme Mtwara (Msuya 1995, 1996, 1998). Two seaweed nurseries were established in Mtwara, at Miseti village, and Lindi at Ruvu Be village, with the seedlings transplanted between March and June 1996 by 15 village communities (Msuya 1996). In 1997, 21 villages had seaweed farms in Lindi and Mtwara Regions, involving 2,000 people (Msuya 1998). The RIPS programme provided raw materials such as nylon ropes to hold the seaweed and thinner nylon strings known as "tie ties" for tying the seaweed and seaweed

seedlings onto the thicker ropes. The Zanzibar Agro Seaweed Company Limited (ZASCOL), a private firm based in Zanzibar, was contacted by the Dr. Msuya[48] to buy the farmers' produce. Dr. Msuya and her RIPS team did not visit Songo Songo Island during the feasibility studies and implementation period due to the difficulty of accessing the island from the mainland (Msuya 1996). As a result, Songo Songo Island did not participate in the programme and thus did not receive technical support from the government. A primary school teacher and his wife started seaweed farming on Songo Songo Island in 1998. Then three women became interested and asked for seedlings and ropes from the schoolteacher, as they told me:

> *I started farming, I heard people saying, "Seaweed has come, let's go to* Mjumbe".[49] *We went to learn how to farm seaweed. We learned to tie seedlings on the ropes and we took sticks and went to plant the seaweed. After the second week we found our seaweed growing well; the third week we harvested some and used it as seedlings, adding more ropes.* (Amina, seaweed farmer, 2009)

> *I heard people had started farming seaweed, then I saw them going to the intertidal areas. I asked them what benefits they got from seaweed. They told me that the price was 70 TZS per kilogram, so if you get 2 kg you can buy ½ kilogram of maize flour. Then I asked them to teach me; they taught me and gave me seedlings. I did not learn from Mjumbe or anywhere else but from my friend, who gave me seedlings and ropes. (Mbeyu, seaweed farmer, 2009)*

Later on the practice spread to ten women and continued to spread to both men and women who saw the economic benefits of the seaweed farmed by their relatives, friends and neighbours. Currently seaweed is cultivated mainly in the Kikapani, Mauzi, Pembeni, Sanganduru, Njovi, Mchuchuni and Kisuni areas on the island:

> *After that, everyone in our street started farming seaweed, and I was like a teacher here, showing people how to farm seaweed. The whole area was red, covered with seaweed [spread out to dry in the sun]; the whole sea was covered with seaweed because everybody was farming seaweed. For instance in my house, my husband, my children, the 12-year-old and the 18-year-old, and me, we were all farming seaweed. (Bi Mbeyu, seaweed farmer, 2009)*

[48] A consultant of Rural Integrated Project Support (RIPS)
[49] A ten-cell leader is the first point of administrative contact.

Seaweed farmers on Songo Songo Island work together, farming close to each other. Each farmer knows where his or her farm is and who his or her neighbours are. Friends or relatives keep their farms close to one another in case one has problems such as falling ill; neighbours usually help to look after the farm until the farm owner has recovered. On Songo Songo Island, farmers whose farms are near the village can recognise their farms from their houses. Nobody can trespass on the farm of another member of community. If someone does so, the neighbours go after him/her. This ensures the protection of property in the village. Every villager may go to the sea and start a seaweed farm. When the farm is established it becomes the property of the farmer. If a seaweed farmer abandons the farm, the site becomes free property and may be taken by another islander.

4.4.1 Seaweed farming method

The common method of farming seaweed is off-bottom with a floating line. An 5-20 m length of nylon rope, depending on the capacity of the farmer, approximately 4mm in diameter, is stretched between two stakes at least 20 to 30 cm from the sediment to prevent the growing seaweed from being tossed on the sand, and 20 to 30 cm below the water surface at low tide to avoid its exposure to direct sunlight, which kills exposed parts. Attached to the rope, or line, are pieces of thinner nylon rope known as tie ties. Each seedling, weighing approximately 100g, is tied to the tie tie and then to the thicker rope. This method has been used for a long time and is reliable, uses cheap inputs and guarantees an income to the farmers, as other methods need high investment or deeper waters where women, the dominant farmers, cannot easily go.

Figure 4.6: Songo Songo woman at her seaweed farm

While the off-bottom method is generally considered environmentally benign compared to other forms of mariculture (Bryceson 2002), there is rising concern that it may reduce the abundance and biomass of flora and fauna in the underlying sea grass beds, where it is cultivated (Eklöf et al. 2005, Msuya et al. 1996). Mangrove poles are often used as pegs, creating concern about the impact on mangrove stands close to seaweed farming areas.

In both the off-bottom line methods of farming *cottonii* there are eight production cycles per year, but die-offs are estimated to occur in at least one cycle per year in the off-bottom method. The die-off typically occurs in a cycle following the heavy rains from March to May and is probably due to increase in water salinity, sedimentation from runoff and/or temperature differentials during this period (Mmochi et al. 2005).

Farm management and harvesting

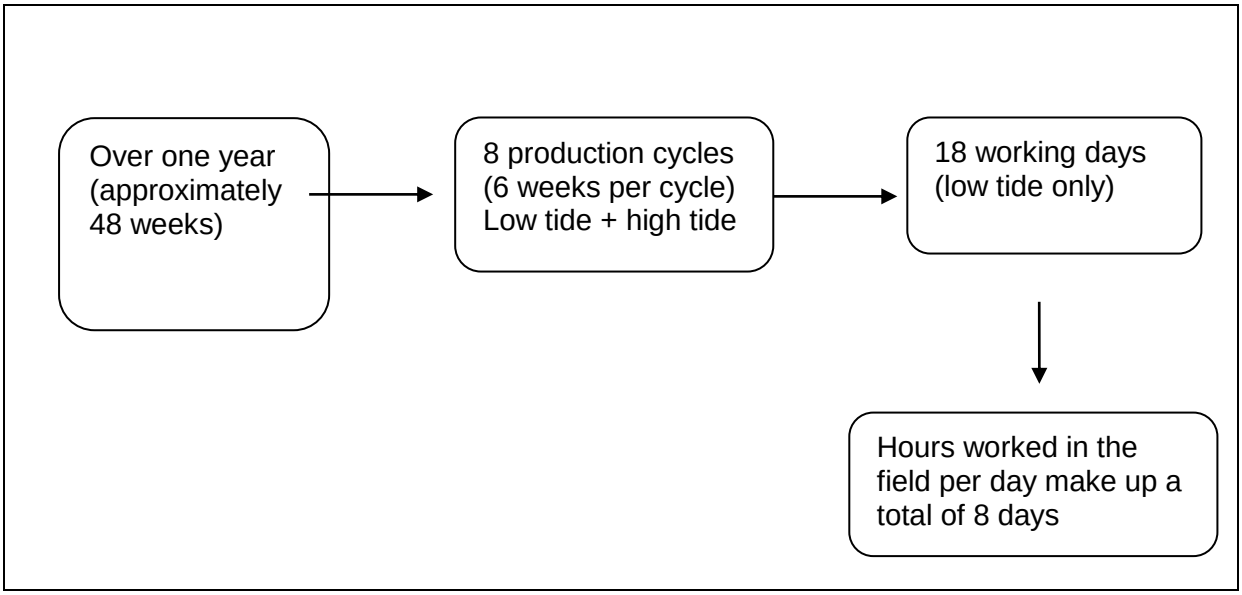
A senior female or male household member manages each seaweed farm. On average two persons per family are involved in seaweed farming. Many farmers have between two and five farms). Most off-bottom plots owned by men are larger than those owned by women. A large, man-owned off-bottom plot consists of 30 lines of 20 m each in length; a woman-owned off-bottom plot has 30 10 m lines. Seaweed seedlings are planted every six weeks. The seaweed grows for six weeks and is harvested and replanted in the same tidal cycle. After each harvest, the seaweed is dried and stored by the farmers until buyers purchase it for export to international carrageenan processors.

Seaweed farming is influenced by temporality – both the long *Kusi* and *Kaskazi* and the short lunar seasons affect farmers. There are eight production cycles per year in the off-

bottom method of farming *K. alvarezii*,[50] (see Figure 4.3). In the long seasons there are also short lunar spring and neap tides; the farmers work on their farms during the low tides, each of which lasts for about two weeks (Msuya et al 2007; Sechambo et al 1996). For example, in Mlingotini village there are eight production cycles per year in the off-bottom method of farming *cottonii*. Each cycle involves a six-week production period in which there are 18 days when farmers could feasibly work on their farms, but they work for only the equivalent of 8 days[51] per cycle if there is no die-off (Msuya et al., 2007).

[50] The off-bottom method is used in shallow sub-tidal waters 30cm at the lowest tide, while the floating line method is used in deeper waters at least two m deep at mean sea level. The floating line method is new to Tanzania (Msuya et al 2007).
[51] Other days are allocated to household chores.

Figure 4.7: Seaweed farming cycles



Source: Msuya et al 2007

When harvesting, women call for assistance from men to carry the bags of seaweed from the sea to the shore and home, where it is dried in the sun. This is mainly because women on the island not only lack vessels but also are not expected to manhandle the seaweed from the sea. The men also assist in sending the dried seaweed to the market. It takes six weeks before the seaweed is ready to be harvested, and depending on the size of the field, up to six bags of dried seaweed can be harvested in a single *bamvua* (spring tide).

In Tanzania, seaweed farmers traditionally do not purchase their own inputs (ropes, tie-ties, floats and seedlings) because the buyers provide them in exchange for an agreement to adopt recommended production and quality assurance measures and to sell them all of their harvest at a fixed price that they dictate (Nanyaro, 2005).

ZASCOL supplies farming inputs to Songo Songo farmers based on a verbal agreement that they will sell their seaweed to them. They provide farming techniques and purchase the seaweed produced by these farmers. The farming areas are open to anybody on the island, as they are seen as open-access.

4.4.2 The socio-economic importance of seaweed farming

Although coastal aquaculture is not extensively developed in Tanzania, seaweed cultivation has already registered significant socioeconomic benefits at the community level. Mariculture experts such as Msuya (2011a, 2011b, 2006), Msuya et al. (1996), and Pettersson-Löfquist

(1995) have studied the economic and social benefits accruing from seaweed farming and its environmental impact and report that 15,000-20,000 individuals involved in seaweed farming have improved their standard of living and income levels.

The preference of the world market for *Kappaphhcus alvazerii* over *Euchema denticulatum* is due to its stronger kappa carrageenan gel compared to the latter's iota carragenaan gel As a result the price of *K. alvarezii* is higher than that of *E. denticulutam*. For example, in Tanzania the price of the former was US$ 0.5 per kg dry weight in 2011, almost double that of the latter, which was US$ 0.25. In 2002, the price of dry seaweed was US$ 0.9 per kg (Bryceson, 2002), compared to the Philippines, where it fetched US$ 0.67-0.73 per kg (Hayashi et al, 2010).

The significance of the seaweed industry as a foreign income earner was documented in 2006 when it comprised 14.7 per cent and 27.3 per cent of the Zanzibar marine resources exports between 1993 and 1994 respectively (Msuya 2006a). The industry is the third most important in bringing foreign money after tourism and cloves in Zanzibar (ibid). In Indonesia 7,350 families source their livelihood from seaweed farming (Watson 2000). In other places such as the Philippines, seaweed has become the main source of income for the village communities farming it (Quinonez, 2000)

Seaweed farming, especially of *cottonii,* has been an integral part of the livelihood system in Songo Songo since the late 1990s (Msuya and Porter 2009). Women dominate it, though men have recently become involved. The farmers include young, middle-aged and elderly people. In 2003, two companies, ZASCOL and Mariculture purchased more than 700 metric tons of dry weight seaweed from Kilwa district, with Songo Songo, Pande and Malalani the main producers (WWF 2005). District statistics indicate that from 2005 the number of seaweed farmers on Songo Songo Island decreased from 1,373 to an estimated 300 (Kilwa District Natural Resource Department 2009). Production increased from 270,000 kg in 1999 to 790,500 kg in 2004. In that year a total of 68,505,600 TZS were obtained from seaweed farming in the district, of which 60,641,800 TZS were obtained in Songo Songo (ibid). In 2008 there was no record of income from seaweed on Songo Songo Island as the seaweed had decreased tremendously due to crop disease (ibid).

My findings from Songo Songo Island show that income obtained from seaweed farming was used for day-to-day expenses such as food, fuel and other items such as school uniforms, books and fees, clothes and modern and traditional medicine. Some used their income as capital for their small businesses. As it is a coral island, the islanders do not cultivate food crops and depend on food imported from the mainland and sold in shops in the village.

When seaweed was at its peak here, other men said it is better if the seaweed disappeared because the women are abusing us. Ilitaka kama kuingia kufuru*'*[52] *in a certain way, because when a women laughed it was seaweed; she talked seaweed and she walked seaweed to the extent that men were fed up with seaweed*. *(Bi Mbeyu, seaweed farmer, 2009)*

Nevertheless, both men and women benefited from seaweed because we were able to do whatever we wanted. If I wanted to do a ceremony such as maulid*,*[53] *or have a birthday party, you just decided yourself what you wanted to do for your son's wedding, or the design of the clothes you wanted to wear. Many houses were built during the time of the seaweed, but now you don't see anyone constructing a new house; some of the houses are still unfinished as there is no money from the seaweed. (Dawa, seaweed farmer, 2009)*

When the seaweed was at its peak, Mwanahariri was living in Dar es Salaam[54] and farming seaweed on Songo Songo with the help of her sister-in-law. She would go to Songo Songo Island to plant her seaweed and then back to Dar es Salaam. Her sister-in-law harvested the seaweed, sold it and gave the money to Mwanahariri's husband. The money their children's secondary school fees and covered her transport costs: "*I was giving him money from the seaweed as he was the one who was responsible for sending the children to school and paying school fees"* (Mwanahariri, seaweed farmer, Songo Songo 2009). The islanders were able to get items from the shops on credit when in need:

I was able to go to the shop and borrow money or items worth 30,000 to 40,000 TZS and the shop owner had no problem with that, as he knew that he would get his money after the harvest. Sometimes I would take 50 kg of rice, and after selling my seaweed, I would pay my debts. (Amina, seaweed farmer, 2009)

Seaweed has also rapidly emerged as a major cash crop in Tanga and Zanzibar, producing enough cash to significantly improve the economic status of both women and households. Mariculture proceeds are used to cover household costs, contribute to school fees, settle hospital bills, buy clothing and meet other expenses (Sechambo and Ngazy, 1995; Msuya et al., 1994; Eklund and Pettersson, 1992).

[52]'Seaweed has become an impiety'.
[53]Religious ceremony performed when celebrating anything from the birth of a child to a wedding or a circumcision.
[54]The commercial capital of Tanzania, approximately 270 km from Songo Songo Island.

Figure 4.8: A woman carrying harvested seaweed from an intertidal area

The focus groups of women under and over 35 years of age provided useful data on seaweed farming on Songo Songo Island at its peak in 2003. Many young women who are now married had made their own money when single by selling woven palm leaves and octopus; when the seaweed was introduced they farmed it with other girls of their age. They used the money they made from all three occupations to buy their own school uniforms, exercise books and clothes, crockery and furniture such as a mattress, a bed, side tables and other items that a married woman needs for her new home:

> *You buy your household items as you know that soon you will get a marriage proposal, so when you harvest your seaweed you buy plates, bowls. (Bi Asha, seaweed farmer, 2009)*

> *A girl buys a mattress, bed, coffee table, side tables, pots and pans, plastic buckets and many other small items for her marriage which she needs in her marital home. (Bi Jamila, seaweed farmer, 2009)*

Young women indicated that they had started farming seaweed when still living in their parents' houses and attending primary school. Some had started when the seaweed was already affected by disease: "I started farming when the seaweed was on the decline: I planted, it decayed, but I didn't stop, and now it is a bit better" (Zena, seaweed farmer, Songo Songo 2009). Some of the women I interviewed were still young and living with their parents when the seaweed was at its peak. I asked them what had happened to the money they made from seaweed and who had made the decisions about this income. Their

response was that they used it to buy household items in preparation for marriage (see 6. 2). Other women did not receive any benefit from farming seaweed:

> *My husband was the one who had my money, he asked to borrow it and he never returned it. I gave him the money and that was the end of it. Therefore I did not buy anything with my seaweed money. (Chiku, ex-seaweed farmer, 2009)*

> *My wife was getting 250,000 TZS from her seaweed: sometimes she'd get 200,000 or 150,000. She didn't do anything with the money.* "Hata haifanyii chochote*", she might say: "My husband, I have got this money – help me with ideas about how to spend it." I just advised her on how to use the money. Therefore even men have been affected by the decline in seaweed. Because at that time even if I travelled to Dar es Salaam and left her with only 10,000 TZS she would survive for the month. Without income from seaweed, I cannot travel and leave her without enough money. (Chiku's husband, a fisherman, 2009*)

Thus in many cases seaweed farming provides significant supplemental income. Some of this may go into buying appliances in the short term, as shown above, or into the capital improvement of houses, businesses, or community structures in the longer term:

> *After selling you might be able to get 90,000 or 100,000 TZS. I was able to build my own house and leave my husband's house to my children. I have not finished yet, as I do not have enough money to finish. (Amina, seaweed farmer, 2009)*

At the beginning mostly women farmed seaweed, but when it became a high-earning activity men also started to engage in it. Some of the men, most of whom were *ulimasi* fishers, got bigger yields than the women as they were able to cultivate bigger plots with more ropes. As the price of dry seaweed was 200 TZS per kilo, in a season of four to six weeks a woman engaged in seaweed farming was able to earn a minimum of income of 100,000 TZS, which was then higher than government minimum wages. Mkopi, worked for a company buying seaweed from the islanders, stated:

> *Seaweed was good, as there was a guarantee that every week a farmer would bring in seaweed worth 30,000 to 60,000 TZS. Others who were better off could keep up to 500 kg of their seaweed in their house before selling. I built a brick house roofed with iron sheets and opened a small kiosk selling groceries but had to close it after the decline of the seaweed. (Mkopi, fisherman/octopus collector, 2009)*

Pollnac and Crawford (2005) note that despite a low correlation between seaweed line length and capital invested in household and furnishings, there were a number of new houses in the coastal sub-villages and numerous new galvanized roofs on older houses in Bentenan and Tumbak.

The Songo Songo Village Executive Officer reported a conflict between the companies dealing with seaweed, ZASCOL and Mwani Mariculture, with the former claiming the right to all the seaweed farmed off the island as it had been the first to supply the productive inputs. When Mwani Mariculture started buying seaweed on the island it did not provide any productive inputs to the farmers and paid 250 TZS per kg compared to the 120 TZS per kg given by ZASCOL. Farmers went for the more lucrative market; hence Mwani Mariculture was able to buy more seaweed than ZASCOL. The latter approached the District Natural Resource Authorities to reconcile the two companies, although it stopped giving ropes and seedlings to the farmers who had broken their monopoly of their seaweed market (Songo Songo Village government 2008). According to a ZASCOL representative on Songo Songo Island, this conflict was taken to the district court of law.

The price paid to Songo Songo seaweed farmers in Tanzania for a kilo of dried seaweed is about 250 TZS ($0.16) (ZASCOL representatives 2009). The price paid to seaweed-buying companies on the global market is about US$400 and US$1,000 for a metric ton of dried *spinosum* and *cottonii* respectively (Bryceson 2002). However, the monopoly of a few international corporations based in Denmark, the UK and the US has led to reduced prices being paid to the producer in recent years (Bryceson 2002; Whitney et al., 2003). Bryceson (2002) observes that the prices paid for dried seaweed are highly variable and outside the control of the small producers, who have no market power. Despite the increasing demand and market price for carrageenan, prices paid to the primary producers of seaweeds containing it have continued to fall (Whitney et al., 2003).

The Tanzanian government has called for the aggressive expansion of seaweed farming in the recently-adopted Seaweed Development Strategic Plan (Nanyaro, 2005). The plan calls for the expansion of *K. alvarezii* (*cottonii),* which fetches a higher farm-gate price than *E. denticulatum*, (*spinosum) (ibid)*. However, *spinosum* is more widely grown in the country, since *cottonii* is more environmentally sensitive and prone to a disease known as “ice-ice” and die-off (Msuya, 2011b; Msuya and Porter, 2009; Msuya 2007; Msuya et al. 2007; Mmochi et al. 2005; Uyenco et al. 1981).

4.4.3 Decline in seaweed farming

At every one of the sites described above, seaweed farming has undergone boom and bust cycles due in some cases to disease, in others to market fluctuations or failure, and to a combination of both. The disease known as ice-ice is the biggest constraint to *cottonii* production on both the Tanzania mainland and Zanzibar. Ice-ice is occurs in farmed seaweed and is characterized by the appearance of whitish spots on the seaweed thalli or branches, which soften and decay causing breakage and leading to the loss of seaweed.

Table 4.5 Songo Songo seaweed production trends 1999-2006

Year	Total weight (kg)	Value (TZS)	Male farmers	Female farmers
1999	70,000	8,400,500	36	173
2000	100,000	12,000,000	85	216
2001	285,500	29,197,000	166	322
2002	192,150	12,665,500	217	300
2003	423,880	847,76,000	409	400
2004	261,635	57,529,700	305	300
2005	168597	37,091,340	263	273
2006	156,592	29,450,240	175	200
2007	144,000	27,072,000	93	183
2008	123,000	24,600,000	35	134
2009	77,000	19,250,000	9	97

Source: Songo Songo village government 2009 & Seaweed Buyers representatives[55]

I found that on Songo Songo Island there has been a decline in the seaweed farming which was at one time an important crop for most households and therefore an important livelihood on the island (see Table 4.5). Most of the people interviewed had been engaged in seaweed farming at one time or another, especially when the seaweed was thriving. Even in households whose head was in formal employment at the gas-processing plant or employed by Security Company in the island, their wives and other members of the household were engaged in seaweed farming (focus group 2009). With the decline of the seaweed, members of these well-off households abandoned seaweed farming.

[55] I did not use the data from FAO because the seaweed from Songo Songo is being exported by different buying companies from both Tanzania Mainland and Zanzibar while the FAO data has data for Tanzania mainland and Zanzibar.

My wife does small activities to help herself, me and our children; currently she cooks snacks. During the seaweed time she was going to the seaweed to contribute to the household income; she used to get 100,000, 70,000, and 60,000 TZS at that time. Nowadays she has nothing – she just cooks snacks. (Rajabu, fisher, 2009)

I interviewed a male seaweed farmer whose house is used as a collection point from where he sends the seaweed to the main buying point. We started discussing the trends of seaweed farming in the area and he indicated that previously the yield had been good and then it started declining to the extent that many people have stopped farming and resorted to octopus fishing. He pointed out some houses constructed during the "good time". I interviewed him as a seaweed farmer and not as a buyer, as his house is just a collecting point and he is not a representative of ZASCOL. Then I interviewed a buyer who was a ZASCOL representative on the island and also had his own seaweed plots. While we were speaking a young boy came to sell his 8 kilos of seaweed and was paid 2,000 TZS, thus one kilo was fetching 250 TZS. Later a man came with a bag of seaweed that belonged to his mother, who was old and could not carry it.[56] The almost-empty warehouse and the few people who brought in seaweed for sale confirmed my findings that the seaweed production had dropped significantly.

The ZASCOL buyer told me that some people related the decline of the seaweed yield to witchcraft and visited *mganga*[57] in Pande village seeking a solution to the problem. They believed that the seaweed die-off was caused by the curse of a woman[58] from the mainland who had come to farm seaweed on the island. When her seaweed was stolen she cursed the whole island so that nobody would ever again be able to harvest seaweed as they used to. According to the story they had not had a good yield since then, therefore they visited the *Mganga* to beg her to lift the curse so the seaweed could thrive again.

Apart from this curse, another reason put forward during formal and informal interviews was a curse from God, as married women were no longer listening to their husbands and made their own decisions without considering how they would affect their husbands (see Chapter 6 for more detail). Women were too independent and it was not easy to control them. This was

[56] This confirmed the statements of the women I interviewed, who said that when seaweed is ready for sale men are happy to take it to the selling point, proclaim that they are helping with the heavy carrying, as discussed in Chapter 6

[57] Traditional healers, consulted for various issue and calamities befalling a person or village.

[58] Witchcraft or casting spells is associated with women not only in coastal areas but also in other parts of Tanzania. Elderly women in Lake Zone (Mwanza and Shinyanga regions) have been blamed for catastrophes in households or in villages and killed.

an idea put forward by one of the older women according to her perception of how a married woman is supposed to behave to her husband:

> *When the seaweed harvest started to decline, the men celebrated and said it was a curse from God, as wives were no longer listening to their husbands. They made their own decisions without considering their husbands' feelings. (Seaweed farmer 2, 2008)*

Another reason raised by respondents was a rise in seawater temperatures due to climate change. This is associated with global warming caused by climate change all over the world. There was also speculation from residents of Songo Songo Island that the presence and activities of the gas-processing plant might have had an impact on weather conditions on the Island and caused a change in seawater temperature.

Even the focus group of the Kilwa district team responsible for fisheries indicated that the decline in seaweed farming on the island might be due to disease caused by pollution from the gas plant. However, there is no scientific evidence to support these claims. The only scientific explanation available was from the short survey done by Dr. Flower Msuya from the Institute of Marine Science of the University of Dar Es Salaam, who claimed that seaweed farming is failing in many of the cultivation sites in shallow intertidal areas where it used to grow in Songo Songo Island. The main cause, observed during Msuya's short survey in 2009, was that the water temperature was higher than had been observed previously in seaweed farms in other areas and the previous year in Tanzania when they had been 33˚C or lower. According to Msuya and Porter (2009), the surface water temperature between 11.00 and 13.00h in seaweed farming areas in Songo Songo ranged from 33˚C to 38˚C.

In their study of North Sulawesi and Rote Island in West Timor, Indonesia, Mandagi and White (2005) indicate that farmers reported problems with the whitening and decaying of cultivated seaweed shoots, possibly caused by bacteria that killed most of the seaweed in their region in 2003. However, Cruz (2008) attributes the lower seaweed production to increased seawater temperature. The ideal temperature for seaweed is below 26º C, but the temperature of the water at the seaweed farms has risen above this. This has led to as much as a 50 percent decline in seaweed production in some areas of the Philippines.

In Zanzibar, in an area where *K. alvarezii* was produced during an experimental period, cultivation has stopped due to die-off (Msuya, 2009). *E. denticulatum*, which is grown in other parts of Tanzania, has not been so severely affected. However, the price of this variety

on the world market is quite low and it is not as profitable as *K. alvarezii* (Mmochi et al., 2005; Msuya 2006b). Similarly, in Bentenan-Tumbak, Sulawesi Indonesia a drop in seaweed prices in 2001 combined with ice-ice disease caused a reduction in seaweed farming (Sievanen et al., 2005).

It has been shown that stress promotes the disease (Sievanen et al., 2005). Other possible factors are the low seawater exchange rate at the farm sites. In off-bottom method, farmers tend to find locations where the water is shallow with small movement and currents. It is thought that the low water exchange rate in such locations might have fostered the reproduction of the bacteria that attacked the seaweed (Mandagi and White, 2005).

The disease has had a big impact on farmers' income; the sample population interviewed indicating that seaweed farming had dropped by 90%. This was confirmed by the buyers, who in 2004 bought an average of 60,000 kg of dried seaweed per month (SAPE 2005) compared to an average of 6000 kg in 2005 (ZASCOL, Personal Communication., 2005) and less than 1000 kg in 2008 (ZASCOL, Personal Communication 2008). Among all these problems, the disease has had the biggest impact on the farmers' income (see Table 4.5) resulting in the number of farmers declining by 60 per cent since the peak period in 2003. In 2009 the production of seaweed had decreased by 94 per cent (Msuya and Porter 2009).

The decline in seaweed has affected other income-generating activities such as small-scale businesses, food vendors and livelihoods in general (mixed focus group Songo Songo 2009). It has had a big impact on the households of artisanal fishers, especially the *Ulimasi*, who supported themselves on income from seaweed farming. More impacts were observed in widows' and divorced women's households where there is no means of alternative support as there is in households where two partners are living together. Most projects that started when the seaweed was thriving, such as the construction of houses, are unfinished and have been put on hold indefinitely due to lack of money (female seaweed farmer focus group 2009). Even though men complained that women had misused their money and had no respect for their husbands when the seaweed was thriving on the island, they acknowledged that the decline of seaweed farming had affected their livelihoods as they no longer had the extra income to support the household, especially during *Kusi* season.

The seaweed is affected by temperature, rain and other environmental factors; during the *Kusi* season much is lost as it is washed off the lines. Stunted growth is common during *Kaskazi* season as *Ulvas pp* (types of sea grass) get entangled in the seaweed. This requires extra time to remove the entangled weed, or the seaweed may fetch a lower price. According to Mmochi et al (2005) and Msuya et al (2007), with the decline in the seaweed

farmers can spend up to six months trying to produce seaweed for seedlings rather than farming seaweed for sale.

4.5 Vulnerability of marine-based livelihoods on Songo Songo

According to Swift (1998b), vulnerability is defined as defencelessness, insecurity and exposure to risks, shocks and stress. Vulnerability to shocks and stress is a very important feature of marine livelihoods on Songo Songo Island and across the whole of the Songo Songo archipelago. Different households experience different shocks, stresses and demands and have a range of assets, stores and claims that change over time. They have strategies for using these associated with the type of shock or stress affecting them. Vulnerability has two sides: the external side of exposure to shocks, stress and risk; and the internal side of defencelessness, meaning a lack of means to cope without damaging loss (Chambers 1995).

The islanders are susceptible to shocks and stress such as disease affecting the seaweed, changes in weather conditions, natural hazards such as tsunamis; weather-influenced seasonality and lunar-influenced monthly tidal variations. The impacts of a shock depend on its frequency, intensity and duration, and persistent shocks make coping very difficult (Dercon 2001) and thus have bigger adverse impacts on rural livelihoods.

The findings from my study indicate that temporality plays a big role in the livelihoods of Songo Songo islanders. The long seasons are associated with trade winds and the short seasons with low and high lunar tides. Songo Songo Island, being in the Indian Ocean, has a tropical climate and is influenced by the northeast and southeast trade winds. The northeast trade wind blows southwards from November to February and brings the highest temperatures and the southeast trade wind blows from April to September bringing heavy intermittent rains (see Chapter 5). On Songo Songo Island the strong southerly or northerly trade winds prevent fishers with weak vessels from going out on the ocean. As explained by one of the island fishers:

> *Lots of people have disappeared at sea. You might go and your vessel breaks down, and if you are using a dhow, the sail might be ripped off, and then you won't be able to come back as you will have no vessel. You just wait in the water until people who have a vessel see you and rescue you, otherwise you might perish. (Hamisi, fisher, 2009)*

In *Kusi*, there are times when the sea is off-limits for fishers, octopus collectors and other users as the strong winds are hazardous (see Chapter 5). Many coastal and marine livelihoods are strongly dependent on the seasonal changes in the climate and associated shifts in resource access (Townsley, n.d). Although *Kusi* is a favourable season for growing seaweed, the problem of strong winds affects most seaweed farmers. The winds lead to the breakage of the seaweed, which is washed away and the farmers have to refix their pegs and replant the seaweed.

Although most households depend on fishing for a livelihood they engage in other livelihood activities or use other means such as getting credit at shops to sustain their households during that time, especially when the men cannot go fishing and have to stay at home for a week or more due to a strong southerly wind or other difficult weather. Others borrow money from VICOBA or fellow islanders to sustain themselves until they are able to go to sea again.

Social relations are how individuals and households are positioned in society. Such positioning is determined by factors such as religion, class, age, ethnicity and gender (Ellis, 2000a). Social networks are important when people face stress and shocks on the island. Women have a system of local finance whereby an amount of money collected on a weekly or monthly basis is given to one member of the group once until the cycle complete. This simple form of informal micro finance is known locally as *Mchezo/Upatu*. There is also formal micro finance from VICOBA, whose men and women members can access credit to overcome stress and shocks. This shows how individuals at the local level make use of any possible means to meet their livelihood demands. These local financing systems indicate the intrinsic potential of individuals to create local solutions to their problems. Women may use their money as capital by giving that money to shopkeers who invest in their shops in the village, and they also receive remittances and help from relatives[59].

Those who have no alternative livelihood because they are single and do not have family support risk going to the sea close to the shore when *Kusi* is extreme, but sometimes this is hazardous. While I was doing my research a single man of about 60 who lived alone was drowned while fishing. The first day he went out he almost drowned, and he was urged not to go to sea the next day, but claimed that he had to go as he had nothing at home. The next day he went out, staying very close to the shore, but his small vessel overturned. This shows the difference between households with family and support and those where divorced or

[59]See Chapter 6 on intrahousehold gender relations, where social and financial systems provide support for women.

widowed individuals live alone. Households also use their various assets such as livestock, fishing vessels and household items to overcome stresses and shocks.

4.6 Conclusion

This chapter has discussed how the sustainability of rural coastal livelihoods depends on a diversity of activities and marine resources. The focus has been on the livelihood portfolios of individuals on Songo Songo Island, with some emphasis on the division of livelihood tasks among men and women. Both cash and subsistence activities are important in the community. Although individual subsistence activities fishing, seaweed farming, and octopus collecting) may not contribute a large amount of cash income to the household, the combined returns of household subsistence activities can significantly contribute to the household's net income.

The chapter has also demonstrated the gender division in livelihood activities on Songo Songo Island and has focused on gender roles and relations as they relate to livelihood activity profiles at the individual and household levels. Women practice occupational pluralism and are involved in a variety of productive and reproductive activities.

Because of the gendered nature of current livelihood portfolios, it can be theorised that changes to the nature and availability of specific livelihood activities, including those linked to fishing, seaweed farming and octopus collecting, have different impacts on men and women. On Songo Songo Island there is not only a division between productive and reproductive labour, with women more involved in the latter, but also a clear gender division in livelihood activities in sectors such as fishing, formal employment, gardening, seaweed farming and octopus collecting. The women move between multiple livelihood activities while the men have a predominant livelihood activity such as fishing and undertake minor activities such as mending their nets when they cannot fish. The next chapter examines how temporality and weather variations influence access to marine resources and explores how Songo Songo men and women access marine resources differently, using a feminist political ecology approach (Rocheleau et al 1996) and applying Ribot and Peluso's (2001) theory of access.

Chapter 5: Gendered Access to Marine Resources

5.0 Introduction

This chapter examines the ways in which social relations, power structures and temporality affect access to marine resources and coastal livelihoods on Songo Songo Island. It focuses on resource access and control dictated by gendered constructions of knowledge and the embeddedness of local gendered environmental struggles (Rocheleau et al, 1996; Schroeder, 1999) on the island. I claim that the dynamics of natural influences such as temporality and human influences on accessing marine resources have a significant impact on the livelihoods of local men and women.

Women's livelihoods have been particularly affected by the introduction of the octopus export market and the privatisation and zoning of parts of the island. To support this claim, I first identify the different ways in which men and women on Songo Songo Island physically access marine resources, which are dictated by tidal variations, weather and local knowledge. Secondly, I assess rights-based access through property regimes as formal and informal institutions, and property rights – changes in access to and control of marine resources due to power relations and the zoning and privatisation of marine resources. Thirdly, I examine different methods and tools of gendered access – capital mechanisms, technology and the effect of local knowledge; fourthly, I discuss how relational mechanisms – in this case social relations and social identity on Songo Songo Island – influence how men and women access marine resources, and lastly, I present my conclusions.

5.1 Temporality and access to marine resources

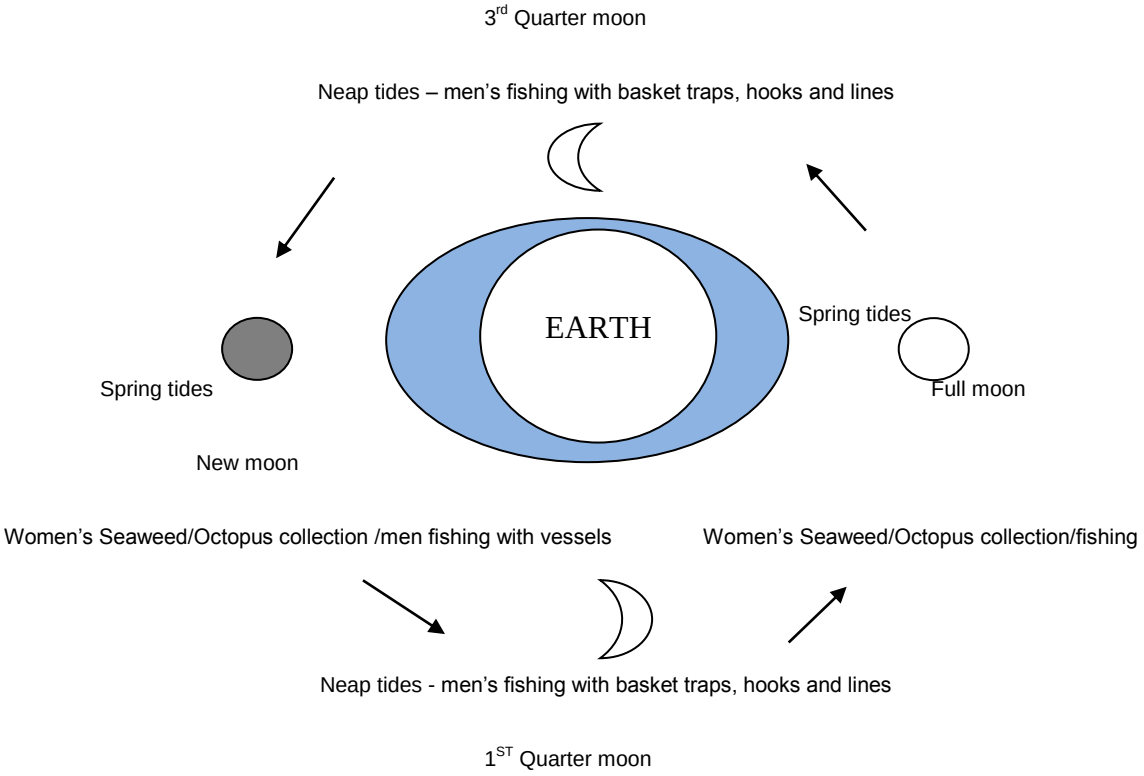
In this section I focus on how temporal fluctuations and tidal changes affect Songo Songo men and women's access to marine resources. I apply Ribot (1998) and Ribot and Peluso's (2003) theory of access in the context of natural resources management as discussed in Chapter 2. Ribot and Peluso define access as "the ability to derive benefits from things" or resources (ibid. 153). They recognise a broad spectrum of access mechanisms that include the role of technology, capital, markets, labour (organisation), knowledge, authority, and social identity. This is relevant in answering my second research question: "How do temporality and other factors affect gendered access to marine resources on Songo Songo Island?" In addressing this question, I extend Ribot and Peluso's (2003) theories of access concept to cover temporal dimensions of access such as the lunar and daily tides and trade winds that influence other mechanisms of access to marine resources in various ways.

Based on my own observation and participation in marine livelihoods and the primary data I collected, the monthly spring tide and neap tide not only affect access to marine resources but also control social activities on Songo Songo Island. Apart from tidal variations, southerly (*Kusi*) and northerly (*Kaskazi*) trade winds and gender relations influence Songo Songo livelihoods. The graphic tidal level (Figure 5.3 & Figure 5.5) and activities table (Table 5.1 and Table 5.2) in this chapter are used to illustrate the times when men and women can engage in different activities as defined by their gender roles and responsibilities. Society-nature relations are portrayed in the way temporality defines the use of space according to gender roles and responsibilities.

5.1.1 Lunar tidal variations

Tides are the periodic motion of sea water as a result of the gravitational pull of the moon and the sun on the rotating earth, and consist of the vertical rise and fall of water accompanied by the tidal currents, which cause a horizontal flow of water (Parker, 2004; Mc Cully, 2006; Owain, 2011). Tides control the shore environment by creating periods of submersion and immersion. There are two distinct cycles in a lunar month, as shown in Figure 5.1: the neap tide, locally known as *maji mafu*,and the spring tide or *maji makuu* or *bamvua*. While navigators use tide and tidal current tables to access the sea, Songo Songo men and women use their local knowledge of temporality, passed from one generation to another, which informs them of the most appropriate time to access marine resources.

Figure 5.1: Lunar and tidal cycles and activities on Songo Songo Island



The Songo Songo islanders use the lunar Islamic calendar to organise their livelihoods and social activities. Everything happening on the island, including the village assembly, government meetings and this research, had to follow the lunar cycle. As indicated in Figure 5.1, the neap tide occurs when the moon is in the first and third quarters of its cycle, while the spring tide occurs at full and new moon.

> *We coastal people use the lunar calendar, locally known as* mwezi*.* Mwezi *10,* mwezi *15, slowly the neap tide approaches, like the Arabic calendar, on* mwezi *15 the water starts to return. Today is* mwezi *18; I can sail my vessel as the place I anchored it is covered with water. Even when we want to travel, we depend on the moon*. (Rajabu, fisher, 2009)

The majority of the islanders are Muslims and it is easy for them to follow the Islamic calendar, which also follows lunar cycles, on which their physical access to marine resources depends. However, they also use their local knowledge of the lunar cycle to time the suitability of different activities on the island and at sea. All of the interviewees from the 75 households knew the lunar cycle, regardless of the nature of their livelihood.

5.1.1.1 Seaweed farming and octopus collection and fishing on the spring tide

Spring tides occur when the moon, the sun and the earth are aligned at full or new moon, when a very high or low tide occurs. The men and women adapt to this lunar cycle, as their different livelihoods, defined by their gender roles and responsibilities, are significantly influenced by the tidal fluctuations. This bimonthly change of tides affects men and women differently. During the spring tide, women farm seaweed and collect octopus while men who fish using lines and hooks go to the reefs for octopus collection, the fishers using vessels and nets go fishing. The women and children also collect molluscs and shellfish for two weeks of the month during the spring tides, which normally occur on the 12th to 19th and 27th to 5th of each lunar calendar.[60]

> *Spring tide starts from* mwezi *10 and stays for one week, then the following week is neap tide; the third week is spring tide, which is for seaweed, that is the time we go to the intertidal area to harvest seaweed and plant new seedlings.* (Mwasiti, seaweed farmer, 2009)

The harvesting of the seaweed is done during the spring tide as the water moves in and out very rapidly compared to the slow neap tide. At the spring tide the women go to the intertidal areas for 14 to 16 days a month to farm seaweed and collect octopus, or are taken by men to the reefs in the archipelago to collect octopus. Before the decline of seaweed farming many women were busy working their seaweed plots and few went to collect octopus. Songo Songo women whom I interviewed claimed an increase in income during the spring tide due to their increased marine activities:

> *If we want to go to the reefs, we wait until spring tide, starting from* mwezi *10; we walk on the nearby reefs close to Songo Songo Island, until* mwezi *13 or* mwezi *14. We go by vessel to, reefs which are far from Songo Songo.* (Bi Mbeyu, seaweed farmer and octopus collector, 2009)

[60] *Mwezi* means a day or date in a lunar month; in this case, *mwezi* 12 means the 12th day from the new moon (see Figure 5.1). *Mwezi* also means a calendar month in a solar year.

Figure 5.2: High water spring tide: women coming back from collecting octopus

With seaweed farming and octopus collection both occurring during the same tidal period, women are forced to make a choice between the two. When the seaweed was thriving, octopus collection declined as the women were busy with the seaweed in the intertidal areas; however with the decline in the seaweed many women have resorted to collection octopus. Maimuna, a seaweed farmer, octopus collector and fried fish vendor during neap tides explained:

> *If you go seaweed farming, forget about collecting octopus on that day, because they all depend on the movement of water in the sea. Ever since I started to engage in seaweed farming I have never engaged in octopus collection. Prior to seaweed farming, I entirely depended on octopus collection.* (Maimuna, seaweed farmer, 2009)

Lunar tidal variations also affect businesses on the island, as when seaweed farmers and octopus collectors do not go to sea for a week or more it has a huge impact on their income and business in the village declines, as explained by both the seaweed farmer and the no-seaweed farmers' focus groups. The interviewees (Salima, seaweed farmer and vendor; Maimuna, seaweed vendor; and Mwanahariri, seaweed vendor, all 2009) also described a strong link between marine-related and land-based activities, as all vendors depend for their income on the fishers, seaweed farmers and octopus collectors. Here, former seaweed farmer Halima, who is married and is now a vendor, explains the income situation during neap and spring tide:

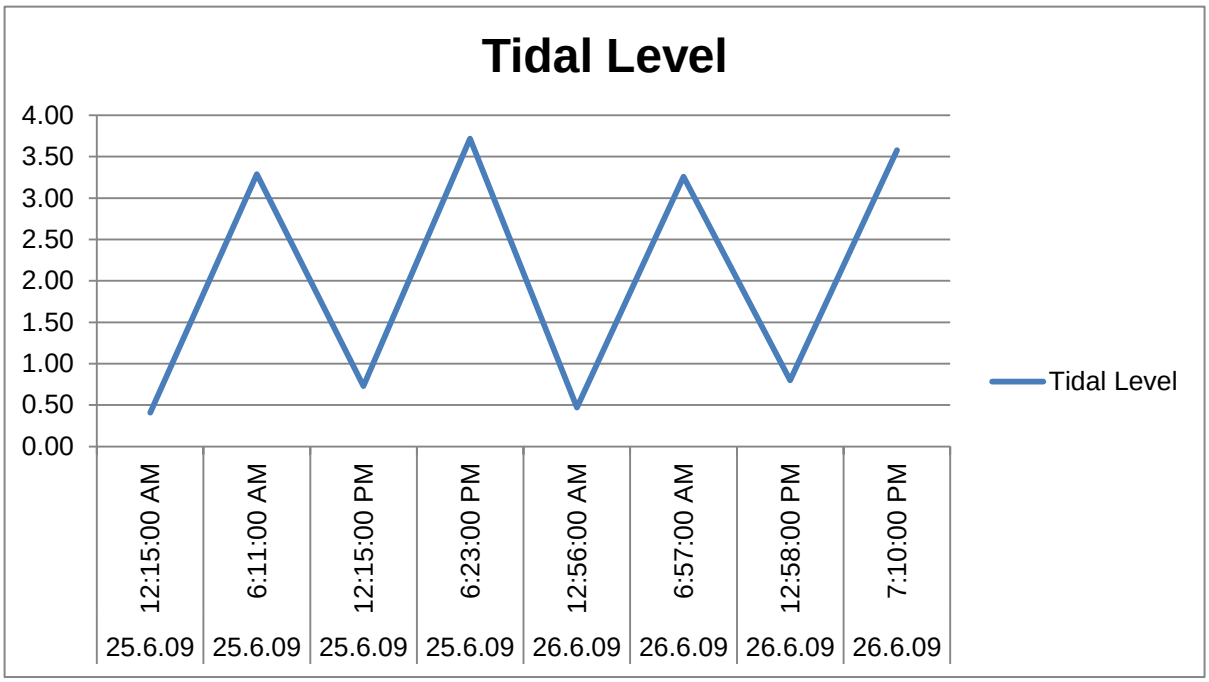
There is a difference between spring and neap tide as we do not go to sea during neap tide; therefore we do not earn anything. *At spring tide we go to sea and earn money*. (Salima, seaweed farmer/vendor, 2009)

When I asked her if her business was affected by the changes in tides, Halima responded:

During neap tide nobody buys stuff from me, as people have no income, but I benefit more in spring tide as everybody goes to the sea. (Salima, seaweed farmer/vendor, 2009)

Apart from the spring tide and neap tides, the islanders' livelihoods are also influenced by daily tidal variation. As in most places the Songo Songo archipelago tides are semi-diurnal whereby the tidal changes occur twice daily, rising to maximum height at high tide or high water, then falling to a minimum level at low tide or low water (Bowditch 2011). There is a relatively small difference between the two. There are six hours between tides, as shown in Figure 5.3.

Figure 5.3: Linear chart showing high and low tides during spring tide



Source: Tanzania Ports Authority 2009

The women's spring tide activities depend considerably on the changing tides. When the tidewater is low they go to the intertidal areas to work on their seaweed farms, or sail with men to other reefs in the archipelago such as Imbi, Nyuni or Njovi (see maps Figure 5.4) to

collect molluscs. This is the busiest time for the women when they are either on their seaweed farms or on the reefs collecting octopus. Those who have small babies to look after or have come from outside the island and work in petty trade remain at home. The timing of daily activities is planned according to the tide, as explained by this seaweed farmer:

> *During spring tide we wait until the tide is low then we go out to the intertidal area to harvest or plant seaweed. We go home in the afternoon around 1.00 to 2.00pm to continue with household chores.*(Amina, seaweed farmer, 2009)

> *Spring tide, I go to the intertidal area, I go to put my seaweed ropes and tie seedling, after that I return home to do my house chores*. (Radhia, seaweed farmer, 2009)

As part of my observation and participation I went to collect octopus with three women whom I had interviewed the day before. I left the house where I was staying in the village at around 6.30 am and walked to the edge of the island, where I met one of the women at her house at around 7.00 am. We picked up a second woman on the way and had to wait for a third to prepare breakfast for her husband and children. We started our trip to the intertidal areas at around 8.15 am and walked for half an hour. This gave me the opportunity to see the tidal changes and Songo Songo women's lived realities. We left the island when the tide was changing from high to low. I could see the water moving out very quickly, and by the time we reached the reef the water was low. We walked on the reef looking for octopus holes, and at around 11.00 am the sea started to come back in very fast. We used the remaining time before high tide to go and look at the seaweed farms. As it was *Kaskazi* (northerly trade winds) season there was very little seaweed, and most was covered by seagrass, thus there was not much to do on the farms. By 11.30 am the women told me it was time to return to the island, as the tide was coming in and would soon be high.[61] I felt very emotional as the woman I had met at the first house was very poor and the sole provider in her household as her husband was recuperating from illness and could not go fishing. When we went to the intertidal area, the other women, who were better off than she was, managed to collect molluscs from the sea but she came back empty handed. As I explained in Chapter 3, I was faced with the dilemma of whether or not I should give her money.

[61]When tides was becoming low, water went out quickly like a river and when the tides was coming in, it was similar so we needed to catch the low tide in order to be able to catch octopus , we also needed to get out before high tide.

Figure 5.4: Map of Songo Songo archipelago showing the fishing grounds

Source: Google Earth

Their local knowledge of the tidal changes enables Songo Song women to plan their daily activities, as illustrated in Table 5.1. They learn from time spent in the intertidal areas and the experience they gain while performing their daily routines defined by the gendered division of labour. Their knowledge is passed from mother to daughter in a space gendered for women and socially constructed as their domain (Thomas-Slater et al 1996).

Table 5.1: Daily activity schedule for men and women during spring tide

Time	Tidal level	Activity	
		Seaweed farmer	**Octopus Collectors and fishers**
5:00 am	High	Wake up: sweep the yard	Wake up and go to the shoreline ready to leave on a fishing trip. They will stay for the whole 14 or 16 days in the fishing grounds. Wake up and clean the house
6:00 am	High	Fetch sea water for household cleaning	Go to the reef by dhow/boat to collect octopus
7:00 am	High	Prepare breakfast	
8:00 am	High		Arrive at the reef and wait for the tide to go out
9:00 am	Low		
10:00 am	Low	Go to the intertidal area for seaweed farming	Walk the reefs collecting octopus
11:00 am	Low	Tend the seaweed	Octopus collection
12 noon	Low	Tend the seaweed	Octopus collection
1:00 pm		Tend the seaweed	Octopus collection
2:00 pm	High	Return home from the intertidal areas	As the water start to rise, sell the octopus and sit back in the boat waiting for high tide
3:00 pm	High		Sail back to the island
4:00 pm	High		Arrive on the island
5:00 pm	High	Dinner preparation; buy rice, coconut, fish or other vegetables as relish	Prepare dinner after buying rice and coconut, using fish or some of the octopus brought back from the reef as relish
6:00 pm	Low	Start cooking dinner for the family	Start cooking dinner for the family
7:00 pm	Low	Dinner time	Dinner time
8:00 pm	Low	Watch TV in their own or their neighbour's house or listen to local radio	Watch TV in their own or their neighbour's house or listen to local radio
8.3	Low	Watch local soap operas in their neighbours' houses if there is no football match that day. If men are watching football, no soap opera for the women and children	Watch local soap operas in their neighbours' houses if there is no football match that day. If men are watching football, no soap opera for the women and children
9.pm	High	Watch a second local soap opera, and if there is no soap opera that day go to sleep.	Watch a second local soap opera, and if there is no soap opera that day go to sleep.
10.pm	High	Sleep	Sleep

Songo Songo women plan their activities in relation to the tide cycles. The timeline for working varies according to the daily high and low tides during both the neap and the spring tide. At spring tide, as Table 5.1 indicates, they wake early in the morning to do the household chores and wait for the tide to go out before going to their seaweed farms in the intertidal areas. Those who go octopus collection do not have time for household chores in the morning, as they have to sail to the reefs with the men while the tide is high. Both go back to their houses while tide is high and continue with the household chores, which are specifically their responsibility according to social construction wherein specific roles, responsibilities and expectations are assigned to men and women. Men who fish by nets and vessels, and divers, go fishing during the spring tides as the vessels sail easily; however, they do not participate in household chores.

The spring tides enable the nets to stay afloat and not be taken by waves. Fishers with dhows and boats with engines and *Jarife* nets go fishing in deep water and in other parts of the archipelago such as Nyuni, Ukuza and Njovi islets (See Figure 5.4). According to the fishermen and my own observations, when the weather is calm during the spring tide men can go fishing for 14 to 16 days a month, as explained by a fisher:

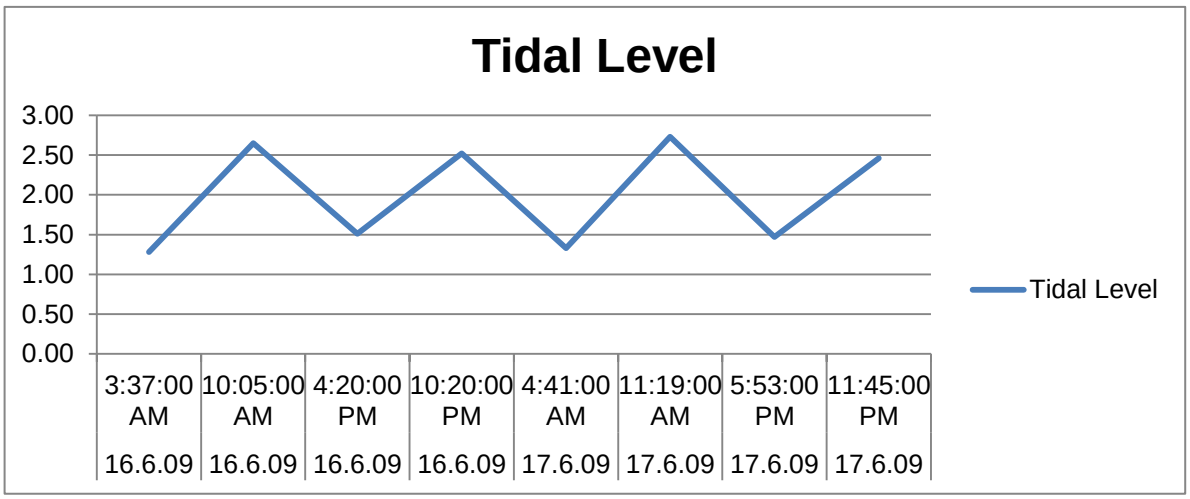
> *I fish using nets during spring tide, which lasts when the ocean is full; high tide lasts for more than ten days. When it reaches the eleventh, twelfth, thirteenth days the water starts slowly to increase enabling vessels to float and I can even upload my fish at the shoreline. (Rajabu, fisher, 2009)*

Figure 5.5: Fishing using nets at intertidal areas, spring tide

5.1.1.2 Fishing and household chores at neap tide

The neap tide is called *maji mafu*, meaning 'dead water', as the sea moves slowly compared to the spring tide, which is called *maji makuu*, meaning 'big water', when the sea moves in and out very fast (Rajabu, 2009: Boldwitch, 2011). Neap tide occurs when the moon is three-quarters or a quarter full and the sun, earth and moon form a right angle (Boldwitch, 2011), as shown in Figure 5.5.

Figure 5.6: Linear chart showing low and high tides during neap tide



Source: Tanzania Ports Authority 2009

The fishermen in the lowest category,[62] who fish in the intertidal areas with hooks and lines and also who use basket traps do most of their fishing during the neap tides.

[62]See section 5.3.1 and Chapter 4: Gendered livelihoods, on fishing categories and enabling assets

Table 5.2: Daily schedule for women and men during neap tide

Time	Tidal level	Activity	
		Women	**Men**
5:00 AM	Low	Wake-up: Sweep the yard	
6:00 AM	Low	Fetch sea water for household cleaning	Those who fish in the intertidal areas go to check their traps for fish
7:00 AM	Low	Prepare breakfast, clean the house	Fishing with hooks and lines
8:00 AM	Low	Go to the bushes for firewood	
9:00 AM	High	Attend social events when firewood not required	Those fishing with nets and vessels mends their nets or engage in other activities
10:00 AM	High	Fetch water on days staying at home	
11:00 AM	High		
12 noon	High	Return from collecting firewood	
1:00 PM	Low	Wash clothes	
2:00 PM	Low		
3:00 PM	Low	Those who process fish go to the shore to buy fish	Return with the fish to sell to the women who process and selling them on the island or to middle men who are transporting fish out of the island
4:00 PM	Low	Attend social events	
5:00 PM	High	Prepare dinner after buying rice and coconut	Go to the football pitch for a football match or play football with others
6:00 PM	High	Begin cooking dinner	
7:00 PM	High	Dinner time	Eat dinner
8:00 PM	High	Watch local TV news or listen to the radio	Watch local news at home or a neighbour's house
8.3	Low	Watch local soap operas	Watch football match with other men at home or at a neighbour's house
9.pm	Low	Watch local soap opera/sleep	
10.pm	Low	Sleep	Sleep

While the *Ulimasi* fishers go fishing during the neap tide, the women stay on land and run small-scale businesses, or they travel outside the island, as explained by Bi Maimuna, a

seaweed farmer, octopus collector and fried fish vendor: *"On* maji mafu *I concentrate on my small-scale business as I buy fish from the fishermen, fry and sell them"*. This is also when women do the household chores (washing clothes, cleaning their houses, collecting firewood, weaving mats, etc.) and other activities not related to the sea, and taking part in social activities in the village. It is easy then to get people to participate in activities such as weddings, burial ceremonies and other social events:

> *During* maji mafu *we have no specific tasks; you will get many women if you need them. Starting from 2 pm you will get many people, but in* maji makuu *nobody is around. (Mwajuma, seaweed farmer, 2009)*

> *I stay at home during neap tide – as you can see I'm just weaving my mat, I'm not in a hurry. Today I'm just weaving my mat. (Mwasiti, seaweed farmer 2009)*

As I discuss in detail in Chapter 6, household chores are considered a female responsibility and a man who helps his wife becomes a laughing stock, as one of the unmarried young man Ahmad indicated in a focus group discussion:

> *I cannot do the household chores such as washing clothes, collecting firewood or even* kukuna nazi,[63] *as people will laugh at me and call me* Bushoke.[64]

The temporal fluctuations and tidal changes influence how Songo Songo Island men and women access marine resources. Household routines change in accordance with the tidal variations, allowing women to fulfill their gender roles and responsibilities, as indicated in Table 5.2. The lunar tides determine when to collect firewood to meet the household's fuel needs and when to go to the intertidal areas or ocean for their livelihood needs as explained by Rajabu:

> *When you know that tomorrow the tidewater will not reach the beach, you leave your vessel at the intertidal area where it will be in water. If you want to go to sea you leave it there. If you fail to take it out before the neap tide, your vessel will be stranded there for five days. You will not be able to get it out until the end of neap tide. We experience that disturbance during neap tide*. *(Rajabu, fisher, 2009)*

[63] Grating coconut to extract coconut milk for cooking: this is considered exclusively women's work.
[64] A man who does household chores

Men who fish by nets and vessels do not go fishing during the neap tides but spend their time mending their nets close to home or even do other activities; however, they do not participate in household chores at all.

5.1.2 Seasonal variations

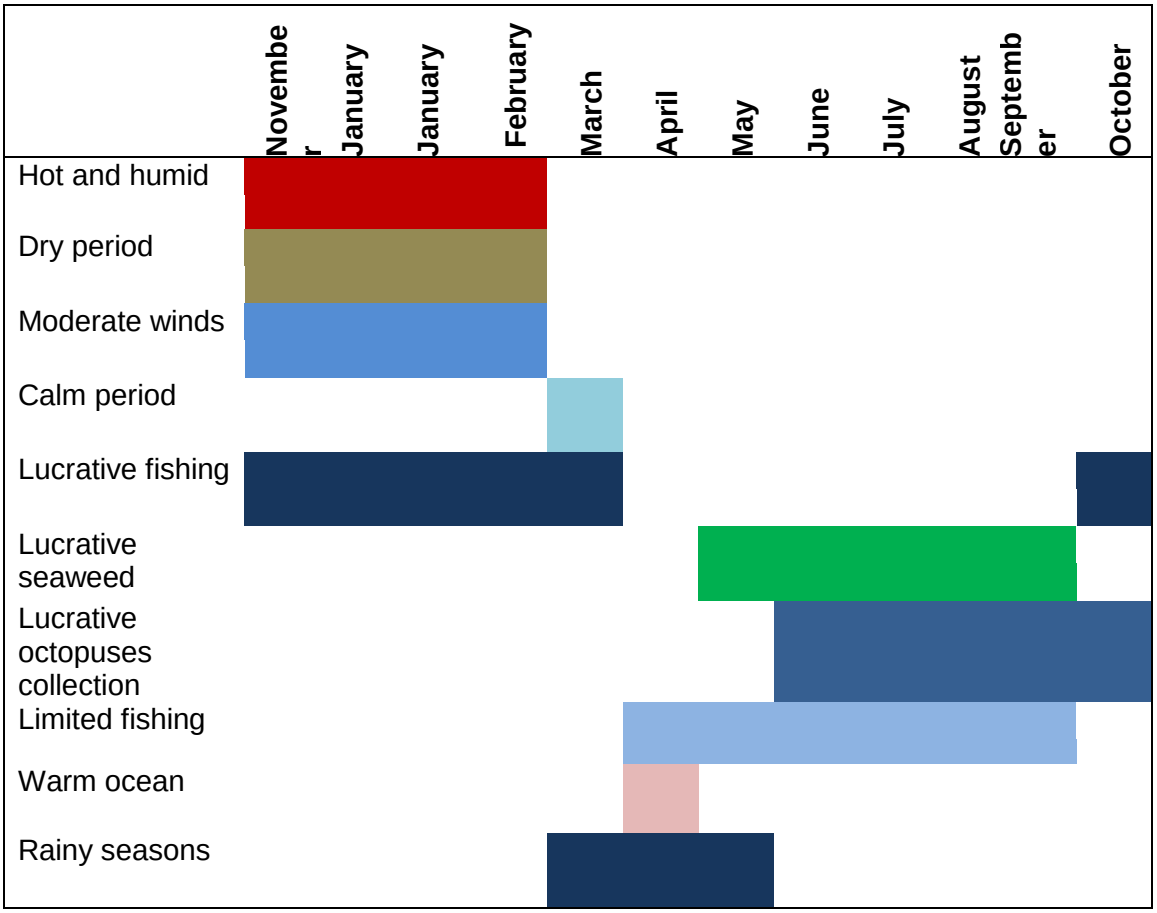
In the previous section I examined how household gender relations are influenced by temporality and tidal conditions. In this section, I show how southerly and northerly monsoon winds also have a strong influence on the men and women's access to marine resources. Since Songo Songo Island is on the Indian Ocean it has a tropical climate and is influenced by northeast and southeast trade winds. While the northeast trade wind blows southwards from November to February bringing very high temperatures, the southeast trade wind blows from April to September, bringing heavy intermittent rain (see Figure 5.7).

Apart from having a significant effect on the climate and the availability of fish[65], these trade winds also affect livelihoods and gender relations on the island. With fishing, octopus collection and seaweed farming the main livelihoods, seasonality plays an important role in how these marine-related livelihoods are accessed. It is important to understand how climatic fluctuations affect the wellbeing of the men and women who depend on marine resources for their livelihoods.

The optimum fishing season in the Indian Ocean is limited to three to four months a year. Most offshore fishing grounds are inaccessible to weak vessels such as outrigger canoes (Richmond &Mkenda 2003) during the remaining months, due to the strong winds and rough seas in some locations, particularly during the southeast monsoon (see Tobisson et al 1998; Richmond & Mkenda 2003). Poor fishers with limited assets are affected most by the weather as they are unable to leave their inshore home grounds due to the *Kusi* strong winds. They are forced to engage in the few alternative economic activities available to them during the low fishing season. The *Kusi* season therefore aggravates poverty and increases vulnerability (Richmond & Mkenda, 2003).

[65] Availability of influenced by Kusi and Kaskazi trade winds which determine access to the sea.

Figure 5.7: Songo Songo Island weather-related seasonal calendar



5.1.2.1 Kaskazi: Northerly Trade winds

The *Kaskazi* starts from November to February and are characterised by hot and humid weather, moderate winds and lack of rain (see Figure 5.7). Although fishing is practiced throughout the year, this is the peak period when the ocean is calmer and clearer (Whitney et al., 2003). It also when people travel from the island to the mainland, taking advantage of the suitable sailing conditions, and the fishers do most of their fishing on the high sea compared to *Kusi* season, as explained by fishers:

> Kaskazi *period is mostly characterised by moderate winds, the soft winds, not strong ones, very soft winds for almost the whole period. Sometimes it can happen that we have strong winds for two or three days, that's all. Fishing is accessible during that time but we have to do that from a distance, as the water close to the shore is very warm due to its high temperature. (Abdallah, fisher, 2009)*

> Kaskazi *has moderate winds different from* Kusi *strong winds. Yes* Kaskazi *has winds, but fishers can go to sea without problems – eeh! – and we get fish. (Rajabu, fisher, 2009)*

> Kaskazi *is good for us, people are working, and there is no wind because here we depend a lot on the weather and the condition of the sea, especially the winds. Therefore during* Kaskazi *there are no winds and a person can work and get money. (Saidi, fisher, 2009)*

Apart from determining patterns in the division of labour, *Kaskazi* also has an impact on the income earned by different members of the household, depending on their occupation. At this time fishers are able to access fishing grounds such as Nyuni and Ukuza and further afield (see Figures 5.4) and men are more in control of the household income and expenditure due to their high fish catch. Women's activities such as seaweed farming and octopus collection decrease, since the weather conditions are not suitable (see Figure 5.7). However, I observed that the women continue seaweed farming and octopus collection even when conditions are not good.[66] The seaweed farms I visited during the *Kaskazi* were covered with fouling green seaweed known as fouling cladophora and there was little to harvest (see Figure 5.8). Women who work as vendors continue their vending activities and fish processing activities:

> *In Kaskazi some of women stay at home and some who have seedlings go to intertidal area for seaweed. Others like me stay at home and weave mats. I do not have any work to do. (Radhia, seaweed farmer, 2009)*

> *Seaweed thrives during the cool period; it does not work well during the hot sunny period, which makes the seawater warm and destroys the seaweed. However during* Kusi *seaweed thrives due to the cool weather. (Amina, seaweed farmer, 2009)*

[66] Chapter 4 describes suitable conditions for farming seaweed and collecting octopus.

Figure 5.8 Seaweed in the intertidal area covered by fouling cladophora during *Kaskazi*

Kaskazi is also when migrant fishers who came from Mtwara, Lindi, and other parts of Kilwa such as Miteja and Nangurukuru during *Kusi*, return to the mainland to continue with their farming activities, resulting in less competition for fish, as explained by one of the fishers:

> *The* Kaskazi *is very dry and windy,* Kusi *is the period of cool temperature, therefore they are many migrant fishers in our village, during* Kaskazi *they go back to their village to cultivate their farms because that is farming time, starting August or September up to October they go back to prepare their farms for cultivation. However starting from April, May or June, when they finish harvesting their crops, they come back to Songo Songo Island for fishing because that is the period we have plenty of fish migrating from high seas to low water while during* Kaskazi *because of rising water temperature fish are moving to the high sea. (Rajabu, fisher, 2009)*

Fishers working from dhows claim that while the lighter *Kaskazi* winds take them to the fishing grounds in the archipelago and out to sea, sometimes they drop and leave them stranded out there for up to two days (Dau, fisher, 2009).

5.1.2. 2 Matlai: the calm period between trade winds

Matlai is the calm period between *Kaskazi* and *Kusi* where there is little or only a very light wind, enabling vessels to go out without problems. This is when the Songo Songo islanders go to the fishing grounds or to the reefs to collect octopus without the stress of strong winds, as explained by one of the fishers:

> *…truly, fishing is good during a period known as* Matlai*. (Khamisi, ex-fisher/guard, 2009)*

Fishing is very productive, very good during Matlai *because during this period there is no wind and the sea is calm. However the problem is* Matlai *period is very short; after the short period of* Matlai*,* Kaskazi *season start then we experience strong winds again, then* Matlai *returns for a short period with calmness before the beginning of another* Kusi*. In general the only period when the fishers are productive is between those two seasons; during* Matlai *when the sea is very calm. (Rajabu, fisher, 2009)*

Mobility is high, as ferries sail between the island and the mainland every day. During *Kusi* the wind is very strong for more than a week and the sea becomes rough, reducing the number of vessels ferrying goods and people from mainland to the island.

5.1.2.3 Kusi: Southerly trade winds

The southeast trade winds (*Kusi*) blow from April to October, bringing the cold season (*Kipupwe*) in June, July and August. The cold season is accompanied by a sea swell, which influence fish migration (Mesaki, 2005). During the *Kusi* season the winds are very strong and the men's fishing vessels cannot endure them force and are thus kept at home:

Kusi *winds take you out to the sea and the sea become very rough, and storms continue until you drown; that why many people are drowned during* Kusi*. (Dau, fisher, 2009)*

Winds do not allow us to go to sea, strong winds with strong waves and the sea becomes rough, the weather becomes really rough, very rough and doesn't allow us to go to sea. (Saidi, fisher, Songo Songo 2009)

You can walk to the reef if you are strong, but if you can't do that you stay at home as the weather doesn't permit. It is very rough; if you decide to sail you might not come back; you might easily disappear when the winds are very strong. (Rajabu, fisher, 2009)

However when the winds are very strong we cannot fish because the ocean becomes very rough! Even if you decide to fish, you will not get anything as the sea become very dusty.[67] *(Abdallah, fisher, 2009)*

[67] Most of the fishers I interviewed pointed out that the sea is not clear and full of dust particles to the extent it is not easy to see anything. 'Dusty' is the word they used instead of muddy, as it is not muddy like the parts close the delta

Kusi leads to a change in activities, as although there are plenty of fish due to the favourable cool conditions the fishers cannot access the fishing grounds in the archipelago. The men occupy themselves with repairing their nets or other activities on the island, and the women concentrate on their seaweed, as the temperature is good for its growth, and collect octopus in intertidal areas close to shore as indicated by seaweed farmers:

> *I planted seaweed during* Kaskazi *and I was not successful, however in this* Kusi *I have started to put out a few ropes, which are giving me hopes. Eeh, yes, the seaweed looks very good, not only on my plot but on other people's plots as well – we have hopes. (Salima, seaweed farmer/vendor, 2009)*

> *With* Kusi *like this, you cannot get a vessel to take you to the reef; people go to the reefs when winds are calm. If the wind is strong you cannot go to the reefs. (Maimuna, seaweed farmer, Songo Songo 2009)*

> *When* Kusi *is calm like this, you can go to the reef if you get a vessel to take you. If you don't get a vessel you stay at home, you walk on the intertidal areas* unapata riziki yako tu basi[68]*. On the reefs you expect to get more, you get* kome, chaza (molluscs)*, but here in the intertidal areas you won't get those types. (Mwanahariri, seaweed farmer, Songo Songo 2009)*

This is the season when the women's income sustains their households:

> *Fisher's income is affected and we are really affected as we stay at home for ten days. My last income was 30,000/= Tshs so if I stay at home for ten days that income will be finished. (Rajabu, fisher, 2009)*

When the situation in our household becomes bad due to Kusi *the men depend on the women to sustain the household. (Maimuna, seaweed farmer, 2009)*

> *With that situation of not going to the sea for seven days, my wife has her small activities at home, then I ask her to lend me some money. I ask her to lend me 15,000/= so that we use that money for these ten days to help us buy food. (Rajabu fisher, 2009)*

[68] You get something small to sustain you for that day only!

The *Kusi* season affects businesses on the island as well, and when fishers and octopus collectors do not go to sea for a week or more this has a huge impact on income and business in the village:

> *Sometimes if winds decide to blow for ten days, it will blow for ten days, and I count: today is the seventh day. We have not gone to sea. (Daima, fisher, 2009)*

> *In addition, when there is wind like that, we do not go to sea, we just stay at home looking at the situation. Our ancestors in those days just put their vessels inland during* Kusi *winds and waited for the wind to drop. You do not force wind, you cannot compete with winds. (Rajabu, fisher, 2009)*

> *Because sometimes there are very strong winds for a month or a week, then the fishers cannot work. Then the winds speed might decrease and become moderate, allowing fishing, which is when we fish. However, when we see the wind has become very strong we do not work, we just collect octopus and sell it but we cannot go fishing as the sailing is very difficult. (Khatibu, fisher, 2009)*

> *A fisher in* Kusi *season is like a person in jail. (Khamisi, ex fisher/guard, 2009)*

When people go to sea at certain times, especially during *Matlai* when the sea is cool and calm, they collect a lot of sea products, and other businesses that depend on them thrive due to their increased income.

In this section I have looked at how natural causes such as tidal variations and seasonal weather patterns such as *Kaska*zi and *Kusi* determine physical access to marine resources. I have shown the link between these lunar and weather-related mechanisms and capital mechanisms in terms of the constraints that determine how Songo Songo men and women access marine resources for their livelihoods. In the following section I look at how property rights and regimes determine rights-based access mechanisms on Songo Songo Island.

5.2 Property Regimes and Rights

This section begins with an overview of the formal and informal institutions governing access to marine resources on Songo Songo Island. It explores how the islanders perceive the ownership of natural resources in terms of property regimes and rights in relation to right-based access mechanisms (Ribot and Peluso 2003). The right-based access authorised by law, customs and convention operate parallel to structural and relational access mechanisms shaping how benefits are gained, controlled and maintained (ibid). Institutions

are socially-constructed rules, norms and shared strategies that enable formal and informal structures and legitimise human interaction and their enforcement characteristics (Ostrom 2005; Scott, 2000) According to Ostrom (2005), rules are enforced prescriptions about what is required, prohibited, or permitted, with defined consequences for rule breaking. Norms are the generally-accepted morals or cultural prescriptions of a group, and strategies consist of plans of action in ongoing situations (ibid).

Some of the Songo Songo villagers' activities are formally governed by fees, licensing and restrictions. The discussion and analysis here proceed from the contention that access to marine resources entails a set of dynamic structures and processes that shape how coastal people interact with their environment in the course of realising their livelihood needs. These structures and processes constitute local and macro aspects of management such as rules, regulations and institutional frameworks regarding how coastal resources are accessed (see Table 5.3). This section discusses the interactions among coastal resource regimes at all levels on Songo Songo Island (Berkes 2006). Traditions, norms, customs and practices in the management of coastal resources operate hand in hand with government laws, rules, policies and regulations guiding access to the marine resources.

Table 5.3: Types of Institutions on Songo Songo Island

Broad categorisation	**Definition**	**Institutional structure/ governing board**	**Sources of legitimacy**	**Responsibility**
Formal/modern Institutions	Regularised pattern of behaviour recognised in law Usually refers to the state and state related institutions	Village Natural Resources Committee Village government Ward Executive office District Natural Resource Office Ministry of Livestock and Fisheries	Statutory instruments eg elections Acts of parliament (see Table 5.4)	Monitoring Issuance of licences Implementing, coordinating fisheries policy Regulating and coordinating of fisheries industry
Informal/traditional Institutions	Conventions and social norms and behaviour. Not recognised by the state Fluid boundaries	Village elders (men and women) Village sheikh	Kinship ties Lineage ties Spiritual and cultural values and belief systems Rituals such as *Zinguo, Mwaka koga*,	Performing annual and other rituals before accessing marine resources

Source: Sythensis from Ribot 1991 and own field notes (2009)

In all institutions described in Table 5.3 above, rights defined by law, custom and convention are mechanisms that shape who controls and maintains access.

5.2.1 Property regimes governing access to marine resources

There are several sectoral policies and laws relevant to the management of marine and coastal resources in Tanzania, and their various uses are regulated by specific laws on fisheries, marine parks, agriculture, forestry, industry and trade, land use planning, the environment, mining, energy and tourism. Table 5.4 summarises the main policies and laws on the use of marine resources on Songo Songo Island.

Table 5.4: Policies and legislation governing the access and use of marine resources in Tanzania

Policies	**Legal documents**
Fisheries Policy 1997 National Environmental Policy 1997 National Integrated Coastal Management Strategy 2003 State of the Coast Report 2003 Rural Development Strategy 2001 Zanzibar Fisheries policy National Environmental policy for Zanzibar 1992	Fisheries Act 2003 Environmental Management Act 2004 Marine parks and reserves Act 1994 Zanzibar Fisheries Act 1988 (with amendments) Zanzibar Environmental Management for Sustainable Development Act 1996

Source: Whitney et al, (2003)

Fisheries policies and legislation contain two aspects that have a bearing on resource access by fishers in general, including migrant fishers. One is the right of the state to apply fishing restrictions for resource conservation purposes (Tanzania Fisheries Act 2003: y57, ZFA Section 6) which include minimum size and weight of the catch, closed periods, areas where fishing is prohibited or limited, minimum mesh size, restricted gear, catch limits and any other measures or schemes to limit fishing access and effort.

Apart from policies and legal documents regulating the use and management of natural resources (see Table 5.4), the Tanzania Fisheries Act 2003 regulates access to marine resources on Songo Songo Island through a system of permits and licenses which regard marine resources as public resources with the state responsible for defining rules and regulations. This means that Songo Songo islanders, and all citizens of Tanzania, are free to access marine resources provided they comply with the state's resource use rules. The Fisheries Act (y17 and y22) states that no person must engage in the fishing or collection of marine resources without a permit, except if using cloth for fishing, fishing for shrimp, using castanets for fishing or a fishing rod or a landline from the beach (Tanzania Fishery Act, 2003). This was confirmed at the focus groups and interviews with village government leaders:

> *Yes, by the government regulations you need to get a fishing license, register your vessel according to the law in order to do your work properly, if you manage to do all that then you are legally known and recognised by the government as a fisher. (Shaka, young men's focus group, 2009)*

Yes, there are regulations in place, for instance, the use of dynamite is restricted, I mean in our community we were guarding our area because the villager is responsible for guarding his village. (Songo Songo Village government leader, 2009)

…if we see anyone we suspect of illegal fishing we told them to go away; we don't want you to use your dynamite in our area. That way we remove people whom we suspect of doing illegal fishing in our area. (Songo Songo village government leader, 2009)

These quotes show that the fishermen are aware that marine resources need to be protected and that the fishing communities do have some form of access control, albeit with limited means of enforcement.

I observed that Songo Songo islanders are very wary of implementing the issue of the Beach Management Unit (BMU).[69] There were heated debates at various meetings with district and Ministry government officials responsible for natural resources, at which islanders contested the establishment of the BMU in their area. The BMU will officially transfer the responsibility for resource monitoring to the resource users. If enforced, it is likely to undermine the authority of elders, traditional and local norms about leadership and possibly the role of elders as sources of local ecological knowledge (Jentoft and Mikalsen 2004). Jentoft and Mikalsen (2004) also discuss how government, by co-opting civil society associations, redirects conflict from the public to the civil domain, redefining its responsibilities as an intra- rather than inter-organisational challenge and thereby avoiding criticism being leveled at the state. This could occur following the establishment of the BMU.

5.2.2 Informal institutions governing the access to marine resources

Traditions, norms, customs and practices connected with access to and management of marine resources operate hand in hand with government laws, rules, policies and regulations guiding the use and management of these resources on Songo Songo Island and in Tanzania. Below, I highlight the roles of the traditional management systems that exist parallel to formal legislation, state institutions and other social forces.

Certain rules and regulations govern the use of marine resources on the island. According to the islanders interviewed, these informal rules are passed down from one generation to the next, setting specific times and seasons when marine resources can be accessed which have ensured their sustainability. For instance, in interviews with Songo Songo elders I

[69]During my field work, the government personnels from the responsible Ministry for natural resources management and from the local government conducted several meetings about the formation of the BMU in the area.

found out that the tools used to collect octopus and the seasonal restrictions ensured their availability and that they thrived. Women collect octopus during *Kusi* season and *maji makuu*[70] only, when the octopus come out of the reef. Collecting them in their breeding ground is not allowed.

Fishing also is also carried out according to traditional rules and regulations and there are restricted fishing periods (Mzee Mbaye 2009). These restrictions create de facto marine reserves on the Songo Songo archipelago. For example, the islanders used to fish on one side of the island during *Kusi* season and leave the other side for *Kaskazi*. This ensured the availability of fish stocks throughout the year. With the gas wells and gas plant this is no longer possible, as fishers are no longer allowed to fish on the side of the Songo Songo Island where these facilities are situated:

> *Previously we were the ones regulating how we go to sea, for instance we used to plan this Kusi we fish on this side of the island [he indicates the eastern part with his hand], and Kaskazi we are going to collect octopuses from that side [indicates the western part of the island with his hand]. (Rajabu, fisher, 2009)*

> *Normally, people from Makonde are the ones who come during that time, while fishers from Zanzibar are not around during Kaskazi. They are at their home place fishing and we fish this side tomorrow and that side the day after tomorrow … (Shaka, fisher, 2009)*

This shows the ambiguities in laws, customs and conventions. It is not uncommon for laws made under one term of government to contradict the laws of another, with rights to the same resources allocated to different parties (Ribot and Peluso 2003). For example, although under the Fisheries Act the Songo Songo islanders are allowed to fish and collect octopus on Songo Songo archipelago and beyond, the natural gas wells, which fall under mining law (Petroleum Act 1980; 2008) and are governed by the ministry responsible for energy and minerals have resulted in zoning and restrictions in areas where there are gas wells and pipelines for safety reasons.

Findings from the semi-structured interviews indicate that the islanders blame the abandonment of traditional rules and regulations governing the use of marine resources for the perceived decline in fish and octopus. They reminisced about the days when they could catch lots of fish and octopus, when their lives were better than now:

[70] High tides

In the past when I go to the reef during the Kusi season I used to get from 20 to 100 kilograms of octopus, but nowadays there is nothing. (Maimuna, seaweed farmer, 2009)

Octopus collection by women is institutionalised as a traditional and sustainable way of harvesting octopus from the reefs. The women walk on the reefs and use sticks designed to catch the octopus using special techniques. Traditional elements are very strong in women's octopus collection and cultural-cognitive institutions are reinforced through the oral and practical transmission of knowledge across generations, as described in the narratives gathered from the semi-structured interviews:

Octopus have declined because we do not have a management program, we go to the reef from mwezi *10 up to the end of spring tide. (Bi Mbeyu, seaweed farmer, 2009)*

First the reef does not rest; we collect from the beginning of spring tide up to the end. (Maimuna, seaweed farmer, 2009)

Secondly, instead of small tool like human finger to collect octopus, men use big iron-made tools like spears, so if the octopus doesn't want to get out they break their houses. (Bi Mbeyu, seaweed farmer, 2009)

Thirdly, there are men who go to the deep water: they go with glasses and a long spear and dive. Octopus breed like humans, so when the breeding one which stays in the cave comes up to lay eggs the small octopi come to live on the reefs; these are the ones we collect , after they have grown. (Bi Mbeyu, seaweed farmer, 2009)

Octopus collection on Songo Songo Island is institutionalised in informal property rights in the form of past sea-tenure systems. These rights, which are passed on by and shaped over generations, are very complex. They include elements of village ownership; for instance the intertidal areas and reefs in Songo Songo archipelago are under the jurisdiction of Songo Songo village. There is, however, an everyday cultural-cognitive institution allowing people from outside Songo Songo Island to use the reefs and fishing grounds based on formal institutions.

I have explained the interaction of the regimes and perceptions of the rules and regulations governing resource utilisation on the island. Although the islanders consider the sea open-access, they have set rules and regulations and expect both islanders and non-islanders to

abide by them, thus in a way claiming ownership of the sea surrounding the island. What they lack is a way to enforce these rules and regulations when outsiders and fellow islanders do not follow them.

Table 5.5: Summary of formal and informal institutions on Songo Songo Island

Benefits activity	**Regulative (rules & regulations)** **Morally binding Common**	**Normative (values & expectations)** **Morally binding Common**	**Cultural-cognitive (categories & cultural schemes)** **Taken-for-granted shared understanding**
Octopus collection	Fisheries Act 2003	Octopus are collected at specific time of the month, resting period must be observed to allow breeding, sticks considered a sustainable way of collection	Traditional sea-tenure and ecological knowledge passed down through generations
Hooks and lines and madema (traps) fishing	Fisheries policies 1993 Fisheries Act 2003	Hooks, lines and madema are considered a "good" and sustainable fishing method	Old traditional fishing method Sustainable fishing Extensive and detailed ecological knowledge
Passive gear Trap fish with bait	Legal and sustainable method	It is "good" to preserve traditional systems of fishing and historical se tenure rights	Old and traditional sustainable fishing method fishing. Extensive and detailed ecological knowledge
Nyavu fishing	Fisheries Law 1997 Fisheries Act 2003	It is "good" to engage in net fishery since it is easy and productive job	Big catch dream Ignoring traditional property rights and sweeping across the seascape
Seaweed	Fisheries act 2003 Seaweed Development Strategic Plan 2001	Respect for the seaweed farms in general, seaweed farming desirable and positively perceived, led to the breaking down of norms	Women's dominion, knowledge passed down through generations Considered a low and undesirable income activity, but one of the few options for women Generally limited ecological knowledge, deep local knowledge of their farms

Traditional management systems and many customs and traditions associated with fishing in Tanzania have broken down due to the pressures of commercialisation, population growth,

technological innovation and the deterioration of the authority of the elders as guardians of the management systems (Tobisson et al 1998).

5.2.2 Property Rights: Rights-based access to marine resources

The property rights in coastal and marine space range from open access (no specific rights), common access (access by membership), common pool (access by identified group) and private property (clearly-defined access) to public or state property (public access rights held in trust by the state) (McKean, 1992).

The analysis of property rights tends to show how gender inequality operates, since property rights regimes determine access to marine resources (Berkes 1989). On Songo Songo Island there are four property regimes: first the common property regime, including the area in village-defined boundaries where villagers do their fishing, octopus collection and seaweed farming in the intertidal areas and the reefs in the archipelago; second, private ownership, which involves the privatisation of rights through the establishment of company-held resource-harvesting rights, in this case the ownership of offshore and onshore natural gas wells; third, state/state-governed resources the right to control and regulate use which is vested exclusively in the government (Mwandosya et al. (1997). Fourthly, there is the open access regime, where no specific rights exist. Local perceptions of marine tenure are indicated in the following quotes:

> *The sea is owned by the government. (Abdul, fisher, 2009)*

> *There are no boundaries, you can take your canoe and go wherever you want to go. Either you want to go Msindai, or Imbi, or if others are going to Imbi then I will go to Nyuni to other reefs in the sea for fishing. (Khamisi, fisher 2009)*

Most islanders interviewed during the household survey indicated that the ownership regimes for seaweed farming area and octopus collection at the time of the research were considered a common property. However, when the seaweed was on the rise there was clear identification and demarcation of seaweed plots and each seaweed farm was privately owned:

> *… when the seaweed was at the peak and there was no more space to put more plots, all the intertidal areas were under private ownership … if you wanted to have a seaweed plot, you had to go to the ones who had plots and ask for a space to put your ropes. (Mwanahariri, seaweed farmer, Songo Songo 2009)*

The sea is considered common property, or a collective field, where everybody can go and harvest; however, it belongs to the islanders and rules and regulations govern its use by which everyone is supposed to abide. Being common property, access to (and control over) fisheries is insecure, particularly for poor fishing households whose subsistence depends on their daily catch. Marine tenure on Songo Songo Island and people's perceptions and understanding of it are inherently contradictory, as they consider the sea open-access because it is governed by the government, but also see it as Songo Songo property under their traditional rules and regulations.

The issue of property rights has been translated into policy (particularly the Fisheries Code) in the form of limited access, defined as "a fishery policy by which a system of equitable resource use and allocation is established by law through fishery rights granting and licensing procedure" (Fishery Act 2003).

The gas wells and gas processing plant have divided Songo Songo Island into two parts, as Figure 5.9 shows. One part belongs to the islanders and the other is controlled by Songas, which has a mandate to run the plant. The part of the island with the gas wells, pipeline and plant is zoned off and patrolled by Songas security guards. No fishing or seaweed farming is allowed in here. Apart from the existing gas wells and gas plant, Tanzania Petroleum Development Corporation, a government entity responsible for oil and gas exploration, is carrying out extensive oil and gas exploration across the Songo Songo archipelago. A new gas well has been drilled at the southern tip of Songo Songo Island known as Kikapani, where seaweed is farmed.

Figure 5.9: Map of Songo Songo Island showing residential area, gas plant and seaweed farms.

Source: Google earth

There is conflict between the Songo Songo islanders and the investors in natural gas exploration and processing due to the privatisation policies allowing gas and oil exploration and extraction on the island and the zoning off of part of the intertidal area, linking local realities with the global economy (Rocheleau et al 1995). These companies, which have rights-based access to natural gas through titles and contractual agreements, exercise their power by closing areas now under their mandate, which were previously used by the islanders under customary ownership.

Figure 5.10: Aerial view of gas plant showing part of the island zoned off

Apart from the influence of lunar tides and trade, the fishing grounds were designated for specific seasons *(Kusi* and *Kaskazi*) which created de-facto marine reserves in the archipelago. For example, by fishing on one side of the island during *Kusi* and leaving the other side for *Kaskazi* the islanders ensured the availability of fish stocks throughout the year as explained by fishers:

> *… before the construction of the gas plant we used to fish on that side, especially during* Kusi *when winds are strong, because that side acts like a wind barrier, and wind is not strong compared to the southern side. (Rajabu, fisher, 2009)*

> *The way this island is located, if a wind blows from north, as in* Kaskazi *period, the southern part of the island is not affected, so people do not go fishing on north side but on the southern side; during* Kusi *they fish behind the island, they fish in the area where there are gas wells. (Shaka, fisher, 2009)*

There is limited access to marine resource use by both men and women on Songo Songo Island[71]. With the seaweed die-off, farmers have resorted to shifting cultivation; they move their farming activity from one area to another looking for the ideal place for their seaweed to thrive:

[71] Although fishers are not allowed to fish on the area which there are gas wells and gas pipeline, they claim that sometimes some fishers are asked by the personnels from the gas plant to fish for them in that area. This create confusion to the fishers as if the personnel can allow them to fish for their own use why can't they allow fishers from the island to fish for their livelihoods under the same strict supervsions.

I didn't harvest any seaweed in my former plot, then my mother told me that this location is much better, therefore I moved my ropes here, hoping that I will be able to harvest this time. (Seaweed farmer 4, 2008)

The situation remained the same while I was doing my fieldwork in 2009, with seaweed farmers moving their farms from one intertidal area to another, as explained by Maimuna:

We are just struggling, moving from one place to another. When I heard that seaweed is good at Kikapani, then I moved my ropes to Kikapani; when you hear that seaweed is thriving on the other side, you go there as well. (Maimuna, seaweed farmer, 2009)

We are saying maybe if we change locations, we move to another location; maybe those bugs [like maggots] are not there; that is why we move from one location to another. (Seaweed farmer 4, 2008)

Nevertheless, the farmers do not have access to the part of the island where there are five gas wells. With increasing exploration for natural gas and oil going on in Songo Songo archipelago, access for livelihood activities such as fishing and seaweed farming in the area is likely to be further limited:

This side where there are gas wells, there are boundaries, they have put boundaries which we villagers are not allowed to fish, and we just pass outside the boundaries. (Khatibu, fisher, 2009)

Seaweed is farmed starting from the new jetty[72] *towards the south-eastern part of the island; even fishing is done from that area. (Abdul, fisher, 2009)*

If they allow us to fish in that area, there is good catch availability; that is why villagers want so much to fish in that area, but it is not allowed. There are lots of fish and octopuses on that side. (Khatibu, fisher, 2009)

Although Songo Songo villagers complain about the gas plant and natural gas wells and their impact on their livelihoods, Songas and other stakeholders in the natural gas project have been engaged in development programs in education and the provision of clean water and electricity on the island, as explained in Chapter 4.

[72] The new jetty is on the project side and was constructed by the project to be used by the villagers instead of the old jetty which is on the gas plant side.

The gas plant and oil and gas exploration activities have attracted a lot of migrants to the island. Both men and women from the mainland arrive in search of employment. When the exploration activity is minimal the men engage in fishing or return to their home villages. However, the women do not engage in fishing, octopus collection or even fish processing business. They are either employed at the gas plant or sell fruit and vegetables. These women are accused of having affairs with married men on the island (see Chapter 6).

In this section I have briefly looked at the formal and informal institutions governing access to and the use of marine resources on Songo Songo Island, because access cannot be understood without reference to existing property rights systems and, in this context, coastal and marine tenure and socio-ecological context. The holders of property rights can assert their sanctioned rights and the associated enforcement mechanisms to control access. In the next section I examine the different ways in which men and women access marine resources using capital and technology.

5.3 Structural mechanisms and access to marine resources

This section proceeds with an analysis of the structural mechanisms that allow access to capital and local knowledge, enabling or hindering Songo Songo islanders gaining, controlling or maintaining access due to economic and cultural circumstances. The culturally and socially-constructed positions and roles of the men and women are clearly defined by the gendered nature of the assets they use to access marine resources. The findings indicate that besides accessing marine resources differently, the use of assets is different among men and women.

Although both men and women access marine resources in intertidal areas, coral reefs and seagrass beds, these zones are segregated by gender (Msuya, 1998; Jiddawi and Ohman 2002). The men conduct fishing activities in deeper waters using fishing vessels[73] such as dhows, outrigger canoes and *mashua,* while women and children wade in the intertidal areas and glean the shore for shellfish during low spring tides (see Figures 5.11, 5.12, 5.13). One of the dangers associated with this is that without protective shoes their feet can be cut by seashells. While men conduct their fishing activities throughout the month, women's activities are limited to the low spring tides (Jiddawi and Ohman, 2002).

[73] Many fishers do not own a fishing vessel. They hire them from the *Tajiri* with whom they have a special arrangement in terms of distribution of the catch or benefits obtained from the sea, as discussed in detail in Chapter 4 on livelihood strategies.

Figure 5.11: Women gleaning molluscs from the intertidal area

Figure 5.12: Mollusc gleaned from the intertidal area

Figure 5.13: Bivalve gleaned from the intertidal area

5.3.1 Capital Mechanisms

There is a strong connection between this section and Chapter 4, especially the section discussing livelihood strategies. Income obtained from diversified livelihoods is used as capital to obtain the equipment or tools needed for marine livelihoods. In this section, I examine the different assets that enable men and women on Songo Songo Island to gain and maintain access to marine resources. I apply Ribot and Peluso's (2003) ideas about how capital mechanisms affect access to marine resources. I use the term "access to capital" in relation to the possession of equipment for the extraction of marine resources (ibid).

The artisanal fishers of Songo Songo Island use simple, passive fishing gear, mostly in depths not exceeding 30m (Jiddawi and Öhman 2002). The gear and vessels used are mainly traditional and low-cost, such as outrigger canoes, lines and hooks, nets and light portable fish traps locally known as madema*.* Modern equipment includes gill-nets and beach seines, and boats with engines and scuba-diving have recently been introduced to the island, mostly by migrant fishers. The most common fishing methods on Songo Songo Island remain trap fishing and hook and line fishing.

The means of propulsion of most fishing boats on Songo Songo Island are mainly paddles, long poles and sails. My findings from the household survey show that among the 75 households there are ten dugout canoes without outriggers, six dhows and four *mashua.* Only five are fitted with engines, one of which is owned by the RUMAKI livelihoods group:

> *All Songo Songo fishers are artisanal due to the lack of capital; if you compare them, there is no one who has both a vessel and engine. If you look at their vessel, the biggest one is a dhow. In addition – you can count them – maybe on the whole of Songo Songo you might find only seven or eight people who own dhows. (Khamisi, ex fisher and guard, 2009)*

Assets affect how households access marine resources on Songo Songo Island, as lack of efficient fishing gear and strong vessels prevents access to profitable fishing grounds. The small number of boats with engines means that fishing has to be carried out in the shallow areas around coral reefs that are easily accessible from the island. The fishers interviewed claimed that motorisation improves fishing efficiency and enables access to less-exploited deep-sea areas. The sites easily reached without an engine are under serious fishing pressure throughout the year, and the islanders are unable to use more abundant marine resources to relieve their impoverishment, which stifles their asset development. The few

households that have good fishing gear and vessels have different status to those with few assets. Therefore the quantity of marine resources gathered varies greatly depending on the assets available.

Assets determine not only access to the fishing grounds but also the class or category of fisher. The type of fishing gear and vessels used determines where an individual can fish. As discussed in Chapter 4 on livelihoods, there are four categories of fishers on the Island. The lowest category fishes with a static hook and line, catching one fish at a time in the intertidal areas. The second category uses lines and hooks from small dugout canoes in the intertidal areas. The third type has access to fishing grounds further afield from bigger, locally-made wind-driven vessels and nets. The last category uses nets with a 6-inch mesh and bigger sailing vessels, some with engines, which allow access to fishing grounds around Njovi, Nyuni and Simaya islets (See Figure 5.4). Sometimes these even go beyond the Songo Songo archipelago, as Abdallah Juma, in this category, explained: "*Sometimes we go as far as Mozambique to catch sharks*".

From my field observations it is clear that the nature of the fishing gear and vessels used by the fishers as part of their household assets are key factors in their access to marine resources on Songo Songo Island, and that apart from men and women accessing marine resources differently due to the gender differences and the assets that they have, there are also differences among the men themselves (Mwaipopo, 2000; Whitney et al, 2003).

The respondents regarded ownership of fishing nets and vessels as the most secure form of local property ownership on Songo Songo, since these tools ensure their livelihoods. The choice of gear is influenced by the fisher's capital and economic and environmental considerations. Fishers are flexible in their use of gear, although they usually have strong preferences based on experience and their expected catch, as indicated by a fisher who uses a dhow:

> *I decide where to go for fishing, as I do not have an engine. If there is a strong wind like the one that killed a fisher yesterday, I have to use my experience and wisdom to sail from Simaya to Somanga. (Dau, fisher, 2009)*

This shows the link between lack of capital and knowledge, as fishers who do not have an engine use their local knowledge and experience to overcome most of the obstacles they face as a result. Most of the vessels lack cooling and freezing facilities, so fishing is limited by both time and distance; thus fishers continue to fish the same grounds as were fished by earlier generations. There are no storage facilities, so they are given ice by the fish- and

octopus-buying companies or buy it from them illegally, obliging them to sell their catch to them. Those who are not given ice resort to ways of getting it illegally, as explained by Dau, who fishes using nets and has his own dhows:

> *I get ice, I can say, through stealing. I go to the factory at Kivinje and wait with my money. When they start packing ice for the vessels coming for the octopus I give them my money and they give me ice. However, that is not a legal way of getting ice; it is like stealing. If I am caught and they ask me where I got the ice, I will not be able to account for it… (Dau, fisher, 2009)*

When I asked why he needed to buy ice illegally from the companies distributing ice to the octopus collectors, he responded:

> *They do not sell ice. Trucks from Dar es Salaam bring ice to the factory for transporting octopus to Dar-es-Salaam; I have heard that they are being exported outside the country. If they find out that you do not sell your catch to them they do not give you ice. Therefore, they do not give me ice as I do not sell my catch to them. Although they are supposed to buy octopus they also buy fish at a very low price. (Dau, fisher, 2009)*

With the lack of ice and ice-making facilities on the Songo Songo Island, having a vessel with engine power enables fishers to move from fishing grounds to landing sites quickly, giving them control over the sale of their catch.

Both the men and the women use different tools to catch octopus on foot around the coral reefs. Men are able to collect more octopus by diving in the far reefs (see Figure 5.14), which allows them to catch and sell them throughout the month. Women only collect octopus in the intertidal areas at low spring tide. In this way, they have inadvertently protected the octopus resources by giving them time to breed and grow. While women use *utapo*[74] to catch octopus, men use the more effective *mdeki* (see Figures 5.15 and 5.16), a long iron rod with a sharp edge, to hit and collect them:

> *You walk on the reef with your* utapo *if you are a woman and* mdeki *if you are a man; sometimes we put a rope on top of the* utapo *or* mdeki*. When you see octopus hiding in a hole covered with some small stones on the reef, you take away the stones, put your* utapo *in, and pull it out. (Abdul, fisher, 2009)*

[74] A stick or small rod with a curve at the end

Figure 5.14: Aerial view of one of the reefs where fishers and women go to collect octopus.

Figure 5.15: *Mdeki* used by men to collect octopus

Figure 5.16: Women using *utapo* to collect octopus

Although seaweed farming and octopus collection are considered women's activities, the influx of foreign companies buying octopus have made it profitable to the extent that men are also engaging in it. This also occurred when seaweed farming was thriving and the women were making a lot of money, as a male seaweed farmer explained:

> *I worked very hard at seaweed farming, after seeing the seaweed profit; I bought a canoe to help me in my activities, a big canoe which I used to carry 27 bags of seaweed. (Shabani male octopus collector & seaweed farmer, 2009)*

With the decline of the seaweed the men have abandoned it and turned to octopus. Apart from competing with the men on the island, the women are also in competition with men who have migrated from outside the island to collect octopus using masks and diving gear which allow them to access deeper water. Bi Mbeyu, who has been collecting octopus since her youth, complained that the migrant fishers and octopus collectors deny Songo Songo women access to octopus:

> *While we wait for the tidal water to become low so that we can walk on the reef and collect octopus, these men use their diving gear. By the time the tide is low we walk on the reef and get nothing! They even collect octopus which are very young and not ready. (Maimuna, seaweed farmer, 2009)*

> *When we are in the vessels waiting for low tide so that we can get out and collect octopus, the divers dive in high tide and collect octopus. By the time it is low tide and*

we get out of the vessels, there is nothing to collect, as all the octopuses have been taken by the divers. (Bi Mbeyu, seaweed farmer, 2009)

By using sophisticated gear to collect octopus the men are denying the women one of their few sources of income, as the latter confirmed in focus groups and semi-structured interviews:

They come with mirrors and gas to collect octopus; how can we compete with them? Now the reefs have become empty, there is no octopus. In short, there is nothing in the sea. If I go to the reef I only get three kilograms. (Bi Mbeyu, seaweed farmer, 2009).

To tell the truth we do not get octopus nowadays; the divers from Pande have overpowered us. These wageni[75] *from Pande like to dive a lot. (Maimuna, seaweed farmer, 2009)*

If you go to sea on mwezi *13, I am a very experienced collector, yet I get a quarter or a half a kilogram – a person with less experience might come back empty-handed and she has a family to feed. (Bi Mbeyu, seaweed farmer, 2009)*

Both men and women complained that the migrant fishers collect octopus using tools that are harvest them unsustainably, affecting the islanders' household income:

They use different techniques to collect octopus than our Songo Songo women do. The way they do it is considered unsustainable. They use a special iron rod like very long nail to spear octopus, while our Songo Songo women use normal sticks. (Rajabu, fisher, 2009)

Octopus are collected from intertidal reef flats and sub-tidal inner reefs for local and inland consumption and for export to European and far eastern markets (Darwal 2000). Outside buyers who export octopus now operate along the coast using specially-commissioned boats to take the fishers to the fishing sites, and they pay premium prices. Mafia Island and Tanga have octopus-processing plants that involve a considerable number of fisherfolk and have overexploited the resource (Jiddawi and Ohman 2002). The octopus are mainly sold fresh or frozen locally, with some going to the restaurant industry. The rest are salted and dried for

[75] Foreign/migrant fishers

export to Kenya, the Middle East and Spain. Octopus is an important item on tourist restaurant menus (ibid):

> *Previously, we did not sell octopus; we used to dry them and wait for traders to come from the mainland and trade an octopus for a pound of maize. We gave him octopus and he gave us millet or maize in return. Now we sell octopus and are paid money per kilogram. (Bi Mbeyu, seaweed farmer, 2009)*

> *And the reefs used to have lots of octopus; we would come back smelling and covered in octopus ink. Nowadays you can go to Nyuni islet and you won't even see an octopus hole. (Bi Mbeyu, seaweed farmer, 2009)*

The global marketing of octopus and seaweed has resulted in Songo Songo women's livelihoods and environment being threatened by men who benefit from this trade unsustainably (Porter et al 2007), as indicated by Bi Mbeyu:

> *They are taking the big octopus which breed and stay in the current at the bottom of the sea; if they go at the bottom of the sea to take the breeding octopus, which octopuses are going to breed? (Bi Mbeyu, seaweed farmer, 2009)*

> *We do not go to sea thinking that there is a decline in octopus; we collect octopus for five or six days and then rest. If we go, all of us should go at the same time – today we go to this reef and tomorrow we go to another reef. If you stay at home, people from Nyuni islet go to the reef. Young men will tell you that they go to the reef even at night: that way, for us, walking on the reef, we will not get any octopus. (Bi Mbeyu, seaweed farmer, 2009)*

> *We go to the reef, from* mwezi *21 to 22, so when it comes to* mwezi *25, what are we going to get? We get nothing; men go to the reefs even at evening and use diving gear. We do not get octopus even for our own relish. In the old days octopus and squid was our relish. (Bi Mbeyu, seaweed farmer, 2009)*

The decline of octopus was evident when we went octopus collection in the intertidal area and came back with none. This is why the women and men on Songo Songo Island complain of the intrusion of migrant fishers and octopus collectors, who arrive seasonally or have moved there permanently:

> *Previously they used to come during* Kusi *season after harvesting millet. When they were not around, our wives collected more octopus. However, nowadays our women*

are not getting octopus due to the presence of the migrant collectors, who collect them with Mdeki *or spears. Our wives were the ones collecting octopus, but now you do not see women doing it due to the invasion of people from many places. (Rajabu, fisher, 2009)*

5.3.2 Knowledge mechanisms: Women cannot sail on their own

Apart from the tools they use differing from those of the men, women are seen as unable to sail on their own, that prevent them from accessing the reefs on the other part of the Songo Songo archipelago:

> *If we talk about the sea, men use hooks and also drag nets; women cannot drag nets even though both men and women go to sea. For instance, when men and women go to collect octopus in a boat they go together, but the man is the one who sails the boat while other men assists him; women just sit waiting. Yes, women go to collect octopus with men. (Khatibu, fisher, 2009)*

When I asked what would happen if women decided to go to the reefs on their own, one of the participants in the focus group responded that as women lack expertise and knowledge about handling an outrigger canoe they are seen as incapable of using one and of making to proper and reasonable decisions when sailing on their own:

> *They cannot! A woman sailing a vessel with her fellow women! They can if they decide to sail on their own, but the problem is handling the rudder and knowing the wind and deciding when to return. There are some who can handle the rudder, like sister Chiku; however, that is a very difficult task and other women would not trust her, they would think "Ooh! we are going to drown!" (Khatibu, fisher, 2009)*

The idea of women not trusting each other to handle a vessel was raised as an indication that they are not capable of handling their own affairs and need a man in their midst to help them make decisions and guide them. In a focus group of men and women aged 25 and over, men pointed out that women do not use vessels on Songo Songo Island because of their lack of expertise in handling them. However, in another focus group of men and women over 35, the men agreed amongst themselves that their culture, customs and traditions set the rules on what assets men and women can use on Songo Songo Island:

> *It is not our custom for a woman to embark on a vessel and sail. (men in focus group discussion, 2009)*

Cultural rules about the use of vessels prevent women from having their own boats or even sailing to the reef for octopus, so when they want to access reefs beyond the island they have to negotiate with men who have fishing vessels or the middlemen who buy their octopus to take them.

This was also evident when the seaweed was thriving. The women carried heavy wet seaweed on their heads from the intertidal areas, while men used canoes to transport their seaweed to the shore. The use of canoes reduces the heavy work involved in harvesting seaweed and fish. When I interviewed one fisher who was farming seaweed between 2000 and 2004 when it was thriving, he said that he and other men used canoes to harvest it:

> *When I was farming seaweed, I was using my canoe to harvest. I just took my canoe to my seaweed plot and put my seaweed in it. Instead of putting in* viroba,[76] *which is very cumbersome work, I used to put my harvested seaweed in my canoe and unload it on the shore for drying. (Khatibu, fisher, 2009)*

This illustrates how cultural settings that deny women the use of vessels are connected to their livelihoods and access to marine resources. As mentioned in Chapter 4, when I asked a question about household assets all the vessels counted belonged to men, with no woman owning a boat, a canoe or even a boat engine.

Men in the lower category of fishers can easily engage in activities that are considered women's work when they see the potential for making good money, as well as continuing with their traditional men activities, whereas women are not culturally allowed to do what is seen as men's work such as fishing with nets and hooks or scuba diving.

Besides men intruding into women's activities when they become lucrative and competing with them, there is a lot of bargaining and negotiating between the men and the women when the women want to go for octopus collection. The fishers charge them fees to take them out to the coral reefs: for every kilogram of octopus caught they charge 200 Tanzanian shillings.[77] The middlemen who buy octopus from men and women on the island indicated that they also take women to the reef on the agreement that they deduct the fare from the catch, which they also buy; for instance if the octopus catch weighs 1 kilogram, instead of paying 1200 Tanzanian shillings they pay 1000 per kilogram. Instead of charging a fixed fare per person, the middlemen have reduced the price of octopus from 1200 to 1000 Tanzanian

[76] Fibre sacks used to store carry seaweed.
[77] The exchange rate is 1$ = 1300 TZS. 200 TZS can be used to buy vegetables or a 20-litre bucket of water from a water vendor. A kilogram of octopus sold for around 1200 TZS in 2009

shillings a kilogram, even if the catch weighs 10, 20, or 50 kilograms. As women have no alternative source of income, unlike men, they accept this, as indicated by a female octopus collector:

> *If you get a kilogram of octopus, the operator of the vessel gets his fee from that: for example, he hires a vessel and negotiates with the* tajiri *who buys the octopus. They list our names with the amount of octopus we got. For example Mbeyu got 5 kilograms, and someone else got 1 kilogram. Then we are the ones who pay for the boat from our sales. If they tell you octopus is 1000 TZS, then the price is 1200 TZS. (Bi Mbeyu, seaweed farmer, 2009)*

> *When you go* Mwamba[78] *you get in a boat, you go and do your work, then when you get something and finish you pay the fare. (Mwasiti, seaweed farmer, 2009)*

When asked how the women go octopus collection, the young men in the focus group responded that boats take them to the reefs, where they wait for the tide to go out then walk on the reefs and collect octopus. When asked if a woman could hoist a sail and go to sea on her own, one young man gave the following explanation as to why this was impossible:

> *A major reason is, you know, a man is different from a woman, because if there is a strong wind people do not go to sea. When man and woman go to sea early in the morning when the wind is calm, and when you are about to go back you see a cloud; a woman will want to go back. However, if you wait for ten minutes, the wind will become very strong and a man knows that; therefore he has to wait and not sail. But a woman will not have patience, she will want to sail back because she will be thinking about her children back home, she will want to sail in order to return home to feed her children; that is the reason women are not allowed to sail. (Khatibu, fisher, 2009)*

In this section I have looked at how economic and cultural circumstances affect the structural mechanisms of access to capital and local knowledge regarding gaining, controlling and maintaining access to marine resources. In the next section I look at how relational mechanisms determine access to marine resources.

[78] *Mwamba:* going to the reef. The islanders usually say 'I'm going *mwamba* 'or 'I'm going *mwambani'*.

5.4 Relational Mechanisms

Having looked at other mechanisms of access, in this section I proceed with an analysis of social relations and gender responsibilities as relational mechanisms of access by which individuals gain, control, or maintain access in sociocultural circumstances. The intertidal areas around the Songo Songo Island coast are a highly contested space where women compete with local men and migrant octopus collectors. Husbands refer to these intertidal areas as their rivals when they comment that their wives "*wamekwenda kwa waume zao*", literally meaning "they have gone to their second husbands". Some men are happy that seaweed is no longer lucrative "*mwani bora ufe*"[79] (Khamisi, fisher, 2009) because female seaweed farmers had stopped listening to their husbands.

5.4.1 Social Relations: Seeking permission from husbands

Besides being where seaweed farming, octopus collection and fishing are carried out, the ecologically rich marine area of the Songo Songo archipelago is also a gendered space. Here I analyze the power relations that underlie access mechanisms (Ribot and Peluso, 2003) by exploring changes in access to and the control of marine resources due to social and power relations. I investigate how the differing levels of access to marine resources have resulted in dissatisfaction and complaints from those who have lost access due to external markets and the zoning and privatisation of marine resources. In previous sections of this chapter I have illustrated how assets and temporality influence how men and women access marine resources. My observations and semi-structured and unstructured interviews revealed that the intertidal areas at Songo Songo Island are gendered spaces, which women need their husbands' permission to access. Apart from the gendered aspects of unequal access to marine resources that I have described, women themselves access the intertidal areas differently depending on their marital and reproductive status.

Married women have to seek their husbands' permission to go to the reef to collect octopus or farm their seaweed. With the decline of seaweed farming, many go to the reefs for octopus as the only viable livelihood alternative left to them. Permission from their husband is a condition of marriage agreed by both spouses. Before marriage, girls are given specific training by elders on how to handle their husbands[80] based on cultural and religious beliefs. They are taught that they must respect their husband and ask his permission before doing

[79] "It is better if the seaweed farming stops"

[80] This is further discussed in Chapter 6, where I illustrate marriage patterns and intra-household gender relations on Songo Songo Island.

any work or activity. A few days or even months before their marriage, young women are kept in their parents' house, known locally as *kuwekwa ndani,*[81] until their wedding day:

> *Someone like your grandmother would come and tell you that where you are going, you need to settle down; don't be stubborn if you are not allowed to go somewhere, don't go. (Sharifa, seaweed farmer, 2009)*

As discussed in section 5.1 on temporality, marine livelihood activities depend greatly on tidal variations: for instance collecting octopus on exposed coral reefs is done primarily during the low spring tides. A married woman needs to ask her husband for permission the day before she wants to go for octopus collection to make sure that she does not miss this specific timing. This affects women's productivity and livelihoods, as narrated by Mwanahariri, a seaweed farmer and octopus collector:

> *When you want to work, you have to tell him that you want to go somewhere to work; if you don't do that, it is forcing and that is not good; Now we have become of age, it doesn't look good, you need to reach an agreement. (Mwanahariri, seaweed farmer/octopus collector, 2009)*

When I asked Mwanahariri what would happen if her husband did not give her permission to go to the intertidal areas or the reefs to work, she said that she would obey with her husband's decision and stay at home; however, she would not be able to contribute to the household income. She sees her contribution of income to household needs, such as food and other necessities, as a means of negotiating access to marine resources:

> *I stop. If he has said he does not want his wife to go to* pwani[82] *then I must stay at home. I calmly look at how our life is going to turn out. "I don't have anything, you have stopped my livelihood, and nowadays we need to help one another". (Mwanahariri, seaweed farmer and octopus collector, 2009)*

Mwanahariri went on to explain that even if women get permission from their husbands they need a vessel to take them to the reefs, otherwise they end up working around their households:

[81] Young women are kept indoors and not allowed to go outside or meet anyone not related to them, from immediately after they are engaged until their wedding day. This is a culture prominent in coastal areas, and a girl may stay indoors for a week, months, or even years. They are only allowed to go from their rooms into the yard, and must lower their voices and not talk to people who are not related to them.
[82] Intertidal areas

You go pwani*, you don't get anything. I went the day before yesterday and came back without octopus; what I got is almost half a kilogram – I couldn't sell that. (Mwanahariri, seaweed farmer, 2009)*

The husbands of women busy with their reproductive role, such as those caring for young babies, do not give them permission to go out to the intertidal areas to work. I observed women with young babies and toddlers staying at home taking care of the children and the household chores. They cannot go to sea or the intertidal areas until their children are old enough to be left with a carer such as a female neighbor or relative; however, help with caring is not easy to find, as most women want to go out collecting octopus or to their seaweed farms. I interviewed Tatu, a seaweed farmer who had stopped going out to the intertidal areas when she became pregnant. Although she lives next door to her parents-in-law she cannot leave her children with her mother-in-law, who goes out to farm seaweed and collect octopus. Tatu stays at home looking after her young children and her younger siblings until they are old enough to be looked after by her neighbour. She sells snacks to make an income of her own; her husband is employed as a security guard at the gas plant and has a stable monthly income.

Men are not involved in caring for their babies, as childcare is considered a women's task. When they do other tasks such as fetching water and firewood for household use the women leave their babies with female relatives or neighbours.

Single women on Songo Songo Island do not need permission to go to the reef; however they are subject to the customs and traditions followed by all women regardless of marital status, which allocate specific tasks to men and women. Mwasiti is a single woman who has never been married. When I interviewed her about her movements, she explained that although sometimes she feels that she needs a man's support she has a freedom that married women do not have. She does not need permission from anyone to go to her seaweed farms or to the reefs:

For me it is different, as I give myself permission. Let's say I want to go to the seaweed plots in the morning; I just go. As for her [a married woman], she has to wait until the husband comes back, at what time! I give myself permission, I work for myself. (Mwasiti, seaweed farmer, 2009)

I discuss this further in Chapter 6, where I consider the findings on the conflicts, cooperation, bargaining and negotiations that take place in Songo Songo Island households.

Figure 5.17: Woman collecting shells and molluscs in an intertidal area

Women's activities on Songo Songo Island are limited by cultural norms and customs that prevent them fishing from boats, going any great distance from home or scuba diving on the reef. They are allowed to farm seaweed, collect octopus and glean for shellfish in the intertidal zone (Porter et al 2007). Their commitments are usually restricted to the intertidal areas and to limited number of hours a day (Jiddawi & Ohman, 2002). Songo Songo women spend approximately four hours during the spring tide, which lasts for fourteen to sixteen days a month, in intertidal areas close to their homes:

> *For example when* Kusi *is calm I can go Mwambani if I get a vessel, if not then I stay at home and walk to reefs close to the village and collect molluscs. I also tend to my seaweed farm. (Mwanahariri, seaweed farmer, 2009)*

While men can use hooks and nets to fish, women are not allowed to fish at all, even using small nets, as confirmed by the young men in a focus group:

> *According to our customs and traditions, it is not the norm for a woman to take hooks and go fishing. You see! Fishing is a man job. A woman's task is to collect octopus only. (Abdul, fisher, 2009)*

> *I believe it is like that: men and women are both involved in coastal livelihoods but hooks and nets are for men only. (Shaka, fisher, 2009)*

In the local language the word “fishing” is masculine. Women's traditional activity of collection octopus is not regarded as fishing. Both men and women would say: "*A woman is not a fisher, she just collect octopus*”, implying that the activity of women in the marine environment is not fishing. A woman in a focus group confirmed this:

> *We Songo Songo women do not fish like Makonde women, who go with their mosquito nets to fish in the intertidal area; we do not fish because we think that we will not get any fish as our culture and customs do not allow us to fish. We also believe that if you set nets you won't get fish. (Chiku, mixed focus group, 2009)*

Although reproductive work, time constraints, mobility, strength and lack of the technology and tools necessary might be responsible for keeping women out of fishing, the Songo Songo women themselves claimed that they stayed out of fishing activities by choice, influenced by custom.

5.4.2 Gender responsibilities and access to marine resources

During discussions between men and women, men explained that although they allowed their wives to go to sea they were not obliged to do so, as their place is at home and it is the man’s responsibility to provide food for the household:

> *And household chores are women's task, because a man is looked up to as a person responsible for bringing* kitoweo *(relish) for a woman to cook; it is not woman's responsibility to go and look for rice or to know what to feed the children – I haven't seen that here! It is her responsibility to stay at home and wait for* kitoweo *and rice. (Daima, fisher, 2009)*

This is part of the productive and reproductive roles of women. When I asked one of the elders whether there is a division of labour on the island, he said:

> *There is division of labour, for example going to sea: fishing is for men only. Even now seaweed farming is a women's task only, however when there was a lot of money even men went to farm seaweed, now it's only women who are dealing with seaweed. Men are no longer doing that. (Juma, Elder, 2009)*

Songo Songo women see this intertidal space as an extension of their household yard or *uani*, where most of their reproductive role is carried out because it is close to home. They go to the intertidal areas at low tide and come back to do their household chores at high tide, as discussed previously. The time spent walking to the intertidal areas is less than that used

to sail to the reefs in the archipelago for octopus. Young men acknowledged their expertise in collecting octopus:

> *She knows where the octopus is, since women are more experienced. When she sees the hole, she knows that there is octopus there and when she puts in the* utapo*, the octopus come out to fight, that's when they catch them with their hands. (Abdul, fisher, 2009).*

During one of my many trips to the intertidal areas I saw a young man harvesting seaweed. When I asked him if the seaweed plot belonged to him, he was quick to respond that he was only helping his mother to harvest her seaweed. Another man in a focus group pointed out that the reason for men not participating in seaweed farming during the decline is that "*if we all of us go to seaweed farms,* tutakufa njaa*".*[83]

> *With the decline in seaweed, if both man and woman engage in that our households will not survive, so men do not farm seaweed. (Khatibu, mixed focus group, 2009)*

When men engaged in seaweed farming when they could earn a good income from it, some had to hide what they were doing from their fellow men, as Khatibu explained:

> *When I started farming seaweed men were laughing at me, so in order to avoid that I built my house where I would not be seen when I went to the intertidal areas to farm my seaweed. (Khatibu, mixed focus group, 2009)*

When seaweed farming did not pay well it was left to the women, but when they could earn a higher income form it the men joined in as well as working at their traditional male activities, revealing that the utilisation of marine resources on the island has changed. This is a clear indication of the power relations between men and women, with men easily able to abandon unprofitable activities, while women cannot do so, and neither can women take on what is traditionally seen as men's work. This is a reminder that women's responsibilities lie more in their reproductive than their productive roles.

[83] We will die of famine.

Table 5.5: Summary of findings in relation to the Ribot & Peluso theory of access

Benefits from marine resources	**Mechanisms of Access**				
	Physical	**Capital required**	**Technology**	**Knowledge**	**Relational**
Seaweed farming	Dependent on lunar and daily low and high tides Activities done on monthly spring tide Influenced by weather related trade winds	Ropes and seedlings provided to the farmer by seaweed-buying companies	With decline of seaweed due to disease, the new method of farming outside intertidal areas requires boats and buoys, thus excluding women	Dominated by women's local knowledge of their farms and farming activities	Married women need permission from their husbands to go to the intertidal areas. Unmarried women can go whenever they want to Women cannot access areas zoned off for the gas plant
Octopus collection	Dependent on lunar and daily low and high tides Activities done on monthly spring tide Influenced by weather-related trade winds	Women use sticks, men use spear-like iron rods and scuba diving gear	Men swim and women walk on the reefs Women do not sail, have to negotiate with men to be taken to the reefs	Local knowledge passed through generations. Women lack men's scuba diving knowledge	Married women need permission from their husbands to go to the intertidal areas. Unmarried women can go whenever they want to
Fishing with hooks and lines, walking on the reefs	Dependent on lunar tide Daily tide changes low/high. Able to fish on both spring and neap tides,	Hooks and lines which cost very little	Use of hooks and lines; simple technology	Local knowledge of fishing sites passed down through the generations	Male activity Women do not fish
Fishing from outrigger canoe using hooks and lines and *madema*	Dependent on lunar and daily low and high tides Activities done on monthly neap & spring tides More fishing on *Kaskazi*	Capital to buy or make outrigger canoe and hooks and lines	Use of hooks and lines & *madema. V*essel technology simple	Local knowledge of fishing sites &use of vessel passed down through the generations	Male activity Women do not fish
Fishing from dhow using nets	Dependent on lunar and daily low and high tides Activities done on monthly neap tide More fishing on *Kaskazi*	Large amount of capital required to buy dhow and for the maintenance of dhow and nets	Use of nets vessel requires simple technology	Local knowledge of fishing sites & use of vessel passed down through the generations	Male activity Women do not fish
Fishing using nets from boats with engines	Dependent on lunar and daily low and high tides Activities done on monthly neap tide More fishing on *Kaskazi*, less on *Kusi*	High capital requirement for boat, engine fuel and maintenance of boat, engine and nets	Use of nets, *V*essel requires complex technology	Local knowledge of fishing sites & use of vessel passed down through the generations	Male activity Women do not fish

5. 5 Conclusion

The multiple mechanisms by which individuals, groups and institutions gain, control, or maintain access in particular political and cultural circumstances have been the focus of this chapter. Causal relationships have been systematically traced spatially using feminisit political ecology (Rocheleau, 1995; Rocheleau et al 1996). Ribot and Peluso's (2003) theories of access do not mention how nature, in this case lunar tidal variations and trade winds, creates gendered access to marine resources. One of the indications coming out of this study is that local knowledge of temporality and tidal fluctuations is crucial to physical access to marine resources.

Understanding the formal and informal institutions governing marine resource and property regimes reveals that access to capital and knowledge are the structural mechanisms regulating actual access. Traditions and customs related to marine resource use have influenced access to them. Both production and reproduction are influenced by the environment in which a household exists, so when the environment changes the nature of household gender relations with regard to resource use is also influenced, as demonstrated by the decline in fish and octopus catches on Songo Songo Island. This has led to members of Songo Songo community abusing the customary norms, values and division of labour. This chapter has shown that social and power relations have brought about changes in access to and control of marine resources. Any changes in marine resource use and tenure patterns can undermine women's access to these resources for their households' subsistence.

Chapter 6: Intra-Household Gender Relations on Songo Songo Island

6.0 Introduction

This chapter explores the influence of seaweed farmers' incomes on their intra-household gender relations, focusing on women's negotiating and bargaining positions. Using Songo-Songo Island households as a case study, the objective is to understand how gender relations were affected in seaweed-farming households when the seaweed farming was on the rise, and when it declined. The analysis in this chapter employs Sen's cooperate conflict model, as set out in Chapter 2. The third and fourth research questions in this study, enquiring how the income of female seaweed farmers affects gender relations in their households and whether their bargaining power changes as their income from seaweed farming declines, can be answered best by applying this analytical framework.

A common position taken in several studies suggests that women's income is a contested route to enhancing their breakdown position (see Boserup, 1970; Brydin and Chant, 1989; Moser, 1993; Haddad, 1999; Gupta, 2007). Bannon and Correia (2006) draw attention to the consequences of women's increasing economic power over men and men's vulnerability, particularly when their traditional livelihoods collapse. On Songo Songo Island women tend to sustain their households during *Kusi* season when the men cannot go fishing. Studies have suggested that at such points, men suffer a crisis of masculinity as a result of women's increased economic power (see Shroeder, 1996; Cleaver, 2002). It is further suggested that when women take a greater share in providing for their family, men tend to opt out or turn to violence (Shroeder, 1996; Silberschmidt, 2001; Amuyunzu-Nyamongo and Frances, 2006).

The chapter unfolds as follows: section 6.1 explores Sen's cooperative conflict model in the context of seaweed farming on Songo Songo Island. Section 6.2 examines marriage and divorce on the island. Section 6.3 discusses women's income contribution to their households and its impact on gender relations on during different seaweed farming seasons; section 6.4 considers women's breakdown position, and section 6.5 highlights the major findings.

6.1 The implications of the cooperative conflict model in this study

As discussed in Chapter 2, Sen's model broadens understanding of gender relations in the context of household income. Perception biases, entitlement and legitimacy criteria and fallback positions in households need to be understood in relation to the gendered impacts of household incomes. Often there are ambiguities about who contributes to household resources, who is entitled to these resources and what this means in terms of the individual's

bargaining position in the household. Understanding these issues requires thorough analysis of three key elements of Sen's cooperative conflict model: the perceived interest response; the perceived contribution response; and the breakdown well-being response. Systematic analysis of these elements can help to explain how members of the household relate to each other over income, and with what effect (Sen, 1989; 1990).This study uses two of Sen's elements to analyse intra-household gender relations, namely the perceived contribution response and the breakdown well-being response, because I focus here on the significance of income in the shaping of intra-household gender relations on Songo Songo Island.

In order to build a consistent and coherent pattern in the discussion of various aspects of how income from seaweed farming affects the woman's position in the households in this community, Sen's model, as adapted here, lays out the variables upon which each of the themes can be assessed, established and analysed. It is important to examine how members of the household cooperate and share, as gender relations in the household are best understood as cooperative conflict: relations marked by some degree of conflict and competition as well as a degree of shared cooperation (ibid).

Sen's model include qualitative aspects, making it relevant to my study, which investigates the relationship between women's involvement in productive activities, their contribution to household income and their bargaining power in households. This requires analysis of women's perceptions of their contributions to households' resources, why and how their perceived and actual contribution differ and how they perceive their bargaining power. In this chapter I examine the influence of Songo Songo women's income on their household bargaining power and fallback position and whether the boom and decline in seaweed income has changed gender relations in their households or whether other sociocultural factors determine gender relations. Table 6.1, below, summarises my findings.

Table 6.1: Examples of the cooperative conflict model on Songo Songo Island

	With seaweed farming	**Without seaweed farming**
Contribution to household income	Women were paying their own personal expenses such as buying their own and their children's clothes. Women paying school fees for their children at secondary school on the mainland and for school uniforms, books and other items needed by their children at the island primary school. Young girls preparing for marriage bought assets to take to their marital home. Women were making their own decisions about expenses, investments, savings such as buying livestock. Some built their own houses and others renovated their marital home. Women had autonomy regarding how they spent their money and had greater bargaining power and a better negotiating position in the household. No changes in the gendered division of labour, as women continued with household chores after coming from their seaweed Women gave their income to their husbands as a gift or loan to avoid conflict in their marriages	Women making minimal contribution to household expenses. With a low income they can only buy small items such as onions, turmeric and salt and have to wait their husbands to bring the daily provisions. Houses under construction remain unfinished, and unaffordable. Women unable to pay secondary school fees for their children.
Breakdown Position	Women had a better fallback position. Those who experienced marital problems opted out of their marriages. Women with income who were not entirely dependent of men easily opted out of oppressive marriage. Some women who had income stayed in their marriage because of kinship ties among their families and lack of support from their natal families. Women were able to afford the fares to attend divorce proceedings in courts on the mainland. Women were able to support themselves and their children financially. No pressure to earn their own living as they were earning their own income . Women able to join social networks such as women's microfinance groups, improving their breakdown well-being position	Women in oppressive marriages unable to initiate divorce as they cannot afford the fare to the mainland courts. Financial insecurity Pressure to earn own living and provide for children Natal family support exists but is not enough without the woman's own income Not enough income to pay for *khula*[84] in the case of abusive husband Without extra income from seaweed, women are unable to take advantage of the support provided by women's social networks .

[84] The separation of the wife from her husband in return for the bride price received

This section has described the relevance of Sen's cooperative conflict model to my research. The following section investigates marriage and divorce on Songo Songo Island. The concept of the conjugal contract is used to explore how marriages are conducted and how the power of marital partners is influenced by factors other than material resources.

6.2 Marriage and Divorce on Songo Songo Island

In this section, I examine marriage and divorce in the local context, starting by clarifying the meanings of these as explained by local men and women. The conjugal contract theory outlined by Whitehead (1984) has been adapted to explore the concept and meaning of marriage and the expectations of marital partners on the island according to cultural beliefs and gender ideologies (Whitehead, 1981; 1984). This complements Sen's cooperative conflict model, which analyses married couples' power relations. The link between the expectations of marital partners and cultural practices determines how the men and women bargain and negotiate in the household.

Before exploring the meaning of marriage as perceived by the Songo Songo community it is important to look at the socialisation process that creates the foundation for women in marriage. From childhood, women on the island are taught to perform household tasks, and signs of laziness are associated with "*bringing shame to the family*" (Bibi Khamisi, seaweed farmer, Songo Songo 2009). Girls are taught the importance of guarding their family honour, as whatever they do in the marital home reflects on their natal home. One respondent observed that some clans fail to raise their girls well, and as a result they have trouble with their husbands (see section 6.3).

Girls are taught to be resilient and tolerant and to defer to their husbands by mentors known locally as a *Somo*[85] and by elderly cousins, aunts and grandmothers. The socialisation process starts at a very young age[86] and is marked by an ear-piercing initiation. The event involves piercing the girls' ears and culminates in showers of gifts and money, just as at birthday parties (see Figures 6.2.1 and 6.2.2). Normally, the girl's mother, aunts, grandmothers and other women witness the event.

[85] A woman assigned the task of teaching young girls societal values and responsibilities and how to behave towards their husband, other men, women and society in general.
[86] The ear piercing ceremony can be done from 40 days , one year depending on the agreement between the Somo and the parents

Figure 6.1: Ear-piercing ceremony: Somo holding her mwali[87] 2008

Figure 6.2: Ear-piercing ceremony; *Somo* introduce her *mwali* to the community, 2009

The *Somo* or mentor is chosen by the girl's parents at birth and is usually a relative or friend of the family. Sometimes a *Somo* may go to the parents and ask to be given the girl to nurture and mentor into womanhood. She is responsible for buying the girl clothes and even other items, according to her income capacity. She trains the girl in how to behave and handles her marriage. If the marriage fails, people in the community ask who the *Somo* was. When a husband is not happy with his wife's behaviour, the *Somo* is the first point of contact before taking matters to the girl's natal family (Caplan, 1975). The *Somo* ensures that the marriage socialisation process goes smoothly. This prepares young girls to observe socio-cultural norms including "norms of socio-religious behaviour that uphold traditions which often resist changes necessary for development" (Afshar, 1994), supporting the view that women are transmitters of cultural values and identities (Kandiyoti, 1991).

[87]A young girl assigned to a *Somo*. Mwali also means a young woman who has reached puberty.

Figure 6.3: Two *Somos* taking their brides to their marital homes

Girls learn to take responsibility for household chores like cooking, caring for children, washing dishes and clothes, cleaning and fetching water and firewood (Caplan, 1975). They are taught to become good wives and to behave appropriately towards their husbands, such as by waiting for them to greet them when they come home from work, preparing their bath, setting out their food, clearing the table after they have finished eating, preparing their clothes for the next day and attending to their sexual needs. The girls are taught how to discuss their complaints or other issues with their husbands:

> *If you tell him and he becomes angry, you know that he is a difficult person,* Haambiliki*, a person who doesn't listen or to whom you cannot tell a thing; then you don't tell him anything in order to avoid arguments* (Tatu, young wife, 2009).

Besides passivity and sexually satisfying their husband, young women are taught negotiation skills before they marry. If the husband's behaviour does not change from *Haambiliki*, they are taught to take the matter to their parents for advice and resolution. If the man is from outside the island, his *Mshenga*[88] is consulted on behalf of his parents to resolve the issue.

[88] A negotiator for a man who wants to marry a woman in the Swahili customs. S/he sends a marriage proposal to the parents of the woman on behalf of the husband's family and is responsible for all marriage negotiations including those over the dowry and wedding ceremonies. He acts as the middle man between the two families.

Most of this socialisation is done in *Unyago*[89] sessions organised by the *Somo* and the girl's parents where the young woman is trained in how to cope with her menstrual periods, her impending engagement and marriage, her sexuality, her relationship with her husband and parents-in-law, and many other matters (Caplan, 1975). *Unyago* sessions usually start when girls have reached puberty (ibid) and involve their seclusion from the rest of the society. For example, Halima's father removed her from school a few months before she was to take her primary education examination:

> *My father took me out of school before I completed my standard seven, and he kept me in isolation,* alinifanyia ushenzi hata sijapata kuona.[90] *I had just reached puberty and was not engaged; he just took me out of school.*
>
> *I was taken out of school without doing my final exams. I cried a lot; I think he colluded with my schoolteachers and kept me in for almost two years before I got married. He did not tell me the reason for taking me out of school, as he was a very harsh person you couldn't negotiate with. (Halima, seaweed farmer, 2009)*

Girls are kept in isolation for a week to two years before marriage depending on the arranged date of their wedding. This isolation happens immediately after parents receive a marriage proposal for their daughter. While in isolation, the socialisation process teaching her how to be a wife, a mother and a daughter-in-law continues until the wedding day.

The supervision of women starts in their natal family, where male kin control young girls, as cited above. Male kin can forcefully marry off their sisters in what is referred to as *ndoa ya dumu*[91] Male kin also control girls' education, as cited above. This male role of supervising women's behaviour is meant to keep women within the cultural practices of patriarchy. This patriarchal power, which male household members assume when they are young, continues into their adulthood and in marriage. It gives men legitimacy to reinforce practices that sustain unequal power relations in the household (Mukangara and Koda, 1997).

[89] Cultural training of young girls before marriage on how to handle their marriage and household and how to satisfy their husbands sexually

[90] A harsh phrase expressing her father's cruelty, *shenzi* literary means barbaric. I left this sentence in Swahili in order to capture the deeply hurt feeling that Halima expressed. The literal meaning is "He has been barbaric with me, an act that I have never seen before".

[91] A Forced marriage that happens when male kin find their daughter/sister in a man's house and marry them on the spot without a ceremony or a marriage proposal. This type of marriage is considered shameful. However, if a girl wants to get married to a person she loves she might resort to this and avoid an arranged married to a person she does not love.

6.2.1 Preparation for Marriage Ceremonies

As part of Islamic marriage, the consent of male members of the bride's family is normally sought before a marriage. For the marriage to be recognised by society, this consent must be sought as a marriage proposal in the form of a letter, or p*osa*, which is sent to the parents of the bride by the *Mshenga*, usually enclosing money (Caplan, 1975). The parents of the bride call on the groom's family and kin to discuss the proposal and decide the bride price. Occasionally they ask the bride what she wants for her *mahari.*[92]

As in other parts in coastal Tanzania, marriage involves considerable expense, which is borne by the bride and groom's families (Caplan, 1997). According to Islamic law, *mahari* is paid to the bride herself, or at least a promise is made that she will be paid at her wedding. This is necessary for a marriage contract to be considered valid (Caplan, 1997; Kikopa, 1981). Once paid, the *mahari* is the sole property of the bride to use in any way she sees fit (Thobani, 1984.)

The groom makes a second customary payment to the bride's family (Kikopa, 1981; Romero, 1988). This bride price is known as *kilemba* (turban) and is paid to the bride's father, while the bride's mother is paid *mkaja* (literally, belt).[93] This is considered an essential part of marriage (Caplan, 1997:88) and is not returned in the case of divorce. These are the most important payments, although there are other, minor customary payments paid to the grandparents and cousins, known locally as *kitoka unyumba.*[94] The bride price is sometimes foregone if the bride is marrying into a prestigious family in the religious community (Romero, 1988). The groom's family has to provide the bride with *sanduku* – a trousseau (Caplan, 1997; see Figure 6.2.3), while the bride's family is responsible for buying bridal assets.

[92]Bride price

[93] Women tie the *mkaja* tightly around their stomach after giving birth to children. This *mkaja* is normally in a form of piece of cloth such as kanga (traditional wrap-around cloth used by women). The *mkaja* signifies the tie between mother and daughter and the labour pains a mother experiences during childbirth. She can either use the money given to her for herself or distribute it to her female kin as token of appreciation and kinship. If the bride's mother does not share her *mkaja* with her female kin they might not participate wholeheartedly in her wedding.

[94]*Kitoka unyumba* is paid to get permission to marry someone else.

Figure 6.4: Sister-in-law bringing in the wedding trousseau on the wedding day

The bride price is mostly used to buy bridal assets and to pay for the wedding preparations. It ranges from 20,000 to 50,000 TZS depending on the economic status of the groom or the kinship of the families. If the marriage is between cousins, the bride price is normally low, as all members of the family contribute towards the marriage costs, including paying the bride price and for the wedding ceremony.

After the bride price is paid, the groom and his family arrange a wedding date. All these pre-wedding processes have implications for conjugal rights and expectations. For instance, the bride price ratifies the marriage and gives the husband the exclusive right to sexual relations with his wife. In the case of the wife's adultery her husband can divorce her. If a woman wants to divorce her husband she is supposed to return the *mahari* to him (see section 6.2.4). The bride is expected to bring assets to her marital home, and her family provides a complete set of household furniture including mattresses and the marital bed (Caplan, 1975). Her *Somo* has a duty to provide the household utensils or contribute to those brought by the bride's parents (ibid). Many married women indicated that the assets they took to their households on their wedding day included beds, mattresses, furniture and utensils (see Figure 6.2.4). Maya said that although she used her bride price to buy her bridal assets, it was not enough to cover the cost of all she needed. She also had to use her seaweed money as well as getting cooking utensils from her *Somo* and relatives to complete what she needed to take to her new home. Spouses are allowed to take what they brought into the marriage when it is over. Thomas et al (1997) use assets at marriage as an indicator of women's bargaining power.

Figure 6.5: *Somo* and other women escorting the bride with her bridal assets to her marital house

6.2.2 Types and nature of marriages on Songo Songo Island

In Tanzania there is a dual legal system for marriage consisting of statutory/civil and religious/customary laws. The Marriage Act of 1971 consolidated family law under a uniform code that recognises Islamic union and the right to polygamy (Rwebangira, 1996). The Tanzanian government recognises four types of marriage: monogamous Christian marriage, polygamous Muslim marriage, civil (potentially polygamous) marriage and traditional/customary marriage, which is also potentially polygamous (Mukangara and Koda, 1997). However, the Marriage Act explicitly states that it supersedes both Islamic and customary law in regulating all four types of marriage (Rwebangira, 1996). Thus all conjugal contracts are protected by both social norms and the legal system, providing women with some form of insurance in marriage (Jackson, 2007).

The Tanzanian Marriage Act also specifies that marriages must be registered as monogamous or polygamous and cannot be changed thereafter; however, a marriage is not considered invalid if it is not registered. Marriage must be voluntary for both the man and the woman, with a guardian's consent for parties under 18, theoretically preventing forced or arranged marriages. The law also stipulates that a woman who cohabits with a man for two years has the legal rights of a wife, and that the bride price is no longer a legal requirement for marriage (Bryceson, 1995). The Act guarantees women's right to their own acquired properties and matrimonial assets (Freeman, 1993) and requires judges to consider domestic activity a contribution to the marital assets (Mukangara and Koda, 1997). This has

implications for men and women's breakdown positions as well as for women's bargaining strength in the household.

The 1971 Tanzania Marriage Act stipulates that the minimum age for marriage is 15 for a female and 18 for a male, although courts may allow marriage at 14 in specific circumstances. The average age at marriage in Tanzania in 1994 was 23 for women and 25 for men (Mukangara and Koda 1997). In coastal areas, particularly among the poor, girls are marriageable shortly after reaching puberty (Romero, 1988). My data show that Songo Songo Island girls are married immediately after finishing their primary school education aged approximately 17.

Figure 6.6: A father at his daughter's marriage ceremony

Figure 6.7: In the absence of the father, the bride chooses a brother to act as her *Wali*[95] during the marriage ceremony

[95] A guardian, Wali is required to give consent for the marriage of the person under his guardianship. It is a very important aspect of marriage in Islam as it determines the validity of the marriage

On Songo Songo Island, as in many parts of southern Tanzania, there are monogamous as well as polygamous marriages (Caplan, 1997). Although marriages on Songo Songo fall under Islamic jurisdiction, which allows a man to marry more than one woman if he can deal justly and equally with them, many marriages in the study area are monogamous. Of the 75 households interviewed, in 54 the marital relationships were serially monogamous. A man might also have a string of concubines, locally known as “nyumba ndogo” (mistresses) who are not legally or socially recognised as part of the household, as the husband lives in his marital home. Men have repeatedly been blamed by women for spending their wives’ seaweed income on these “husband snatchers”, as they are known (see section 6.3). One woman commented: “*They are just here to steal our husbands: selling fruit and vegetables is just a cover for their real business*”.

Only 4 of the 75 households surveyed were polygamous. Under Islamic law, men may have up to four wives at any one time (Caplan, 1975). This permission to marry more than one wife is however conditional: *"Marry women of your choice, in two, in three, in four, if you fear you cannot do justice between them, then marry only one."* (Qur’an, 4:3). The polygamous marriages I came across in my research on Songo Songo Island consisted of two wives who lived in separate houses in the same compound or in different locations on the island, with the first wife treated as the elder (Sims, 1984). The wives stay with their biological children and their husband visits them in turn for two or three days a week according to his arrangements. He has no specific dwelling and stays with either wife, and is responsible for supplying household necessities for them all (Kikopa, 1981). Most men fail to supply their households with the required necessities, although both the Islamic and the Tanzanian law state clearly that a man should not take a second wife if he is not capable of supporting and treating more than one wife equally (Sims, 1984).

The practice of parents choosing the marriage partner is almost nonexistent in urban areas in Tanzania. Women can marry whomever they want. Arranged marriage is more common in rural areas, where society is more traditional. As a traditional society, arranged marriages are common practice on Songo Songo Island. The first marriage for both men and women, which is arranged by their parents and grandparents, is the most important rite of passage from childhood to adulthood (Caplan, 1997) and is marked by extensive celebration by both parties at great expense. These marriages normally take place between close kin. The commonest form of preferential kin marriage is between cross cousins, locally known as *binamu.* Patrilateral parallel cousin marriage is almost as frequent as cross-cousin

marriage[96] (Caplan, 1975). For instance, Tatu was married to her cousin. The marriage was arranged by her grandmother, who told her parents that because Tatu had failed her primary examinations and would not continue her secondary education she must be married to her cousin. She was not consulted on the matter, and was informed that she was to be married to her cousin only two months before her wedding day.

Marriages are based on family and kinship ties, friendship and the well-being of daughters, and less on the financial capacity of the husband. The reason for kin marriage is that the families concerned are bound to know each other well and any marital disputes can be settled without recourse to non-family members (Caplan, 1975). Maimuna's parents refused two marriage proposals from outside the island as Maimuna was considered sick and suffered from asthma, and could not be married to an outsider. She was married to her cousin, whose first marriage had failed after his wife was accused of extramarital affairs. This kin marriage ensures that children have stable marriages (Caplan, 1975) and strengthens kinship ties. Cross-cousin marriages ensure that the parents will be looked after well in their old age by someone in their own family (ibid), based on the gendered responsibility of women to care for their parents when they grow old.

Women themselves consent to these arrangements, as they consider that marriage gives them social status. A married woman is accorded more respect than a single woman, who is considered "*mhuni*",[97] especially if she has come of age. A girl who agrees to be married is seen as bringing honour and respect to her family by avoiding the shame and hardship of pregnancy before marriage. In arranged marriages there is no formal courtship.

Another type of marriage is *ndoa ya dumu*, which mostly happens when a young man is caught sleeping with a young girl to whom he is emotionally attached. My key informant said that male kin arrange this type of marriage if they find that their daughter/sister is having a relationship with a man. They set a trap to catch them and marry them on the spot. This mostly happens at night, and the men walk around the village banging on a bucket or container (*dumu*) to wake the whole island and inform them that the forced marriage has taken place. This type of marriage does not comply with the Marriage Act of 1971 or Islamic law, which require the consent of both partners in order for the marriage to be valid.

[96] Cross cousin marriage is marriage between the cousins of opposite-sex siblings, such as the maternal uncle and paternal aunt's children, while parallel cousin marriage is marriage between the cousins of same-sex siblings such as the paternal uncles or the maternal aunties. In my research on Songo Songo only one respondent was married to her paternal uncle's child. I did not come across a marriage of maternal aunt's cousins.
[97] A shameless person with no respect or manners.

Songo Songo women can arrange their own marriage after being divorced from their first husband, to whom the marriage was arranged by their parents. This is where an adult woman has the final word about her marriage. They are subsequent love or emotional marriages in which a couple generally please themselves as to choice of partner where celebrations are much smaller affairs (Caplan, 2000).

Knowing about these different types of marriages is important when looking at household bargaining positions. A woman whose marriage was arranged by her parents has a different bargaining position to one in a forced or a love marriage, and a woman in a monogamous marriage has a different bargaining position to one in a polygamous marriage. I encountered all these types of marriage on Songo Songo Island.

6.2.3 The meaning of marriage and expectation of the marriage partners

Of the 75 households interviewed, only one was occupied by non-Muslims, as the majority of Songo Songos are Muslims. According to the Tanzania 1971 Marriage Act (Kikopa, 1981), all marriages are supposed to be registered; however, this does not happen in many rural areas as it involves registration fee. There was no formal registration of the four weddings that I attended on the island. However, the marriages are influenced by Islamic law, which prescribes that the duty of the husband is to provide for and protect his household, and gives him his overall responsibility for the welfare of his wife/wives:

> *Men shall take full care of women with the bounties which Allah has bestowed more abundantly on the former than on the latter, and with what they may spend out of their possessions... (Qur'an 4:34)*

This duty includes feeding, clothing and sheltering the wife and any children of the marriage. To Muslims, this legal duty remains after divorce until the end of *eddah*[98] or even longer. The husband is financially responsible for the family, and the wife has no duty to contribute to family expenses unless she has the means and wishes to do so. There is a mutual duty to cohabit, as emphasised by the concept of *Nashiza* whereby a wife who deserts her husband is not entitled to maintenance.

Apart from the basic requirements relating to maintenance and protection, the husband is also required to afford his wife company and marital relations and to avoid doing things that might harm her. Islamic law enforces these obligations, and if a husband fails to visit his wife

[98]Three- or four-month waiting period for a divorced woman or a widow, respectively

for a longer than a certain period or fails to maintain and provide for her, she has the right to be granted a divorce by an Islamic court or council. A woman is also entitled to divorce if she can prove that her husband is causing her harm by drinking alcohol, beating her or abusing her or her parents. In such divorces the husband cannot claim any part of the bride price or the presents he has given to his wife.

The wife, on the other hand, is responsible for reproductive roles such as cooking, cleaning the house, taking care of the children and fulfilling her husband's needs. According to Islamic teachings, she has a choice in matters concerning cooking and cleaning the house, but no choice about taking care of the children.

On Songo Songo Island the concept of *Qawamuh*[99] is followed, as indicated by one of the respected older women in the village, a *Somo*, who related what a married woman is supposed to do to make her marriage a good and a meaningful one:

> *As a married woman you are not allowed to show your power to your husband; he is your husband and under Islamic law he can do anything to you which pleases God because he is your husband. You must listen to your husband and he will not listen to what people says about you in the village because wherever he goes, when he comes back he finds you in the house. Whatever he tells you to do, you must be ready to do it at any time.*
>
> *But a woman who is under man's authority needs to ask her husband's permission when she wants to go out for a visit or to a wedding, and if her husband is not at home she has to wait until he comes back*. *(Amina, Somo, 2009)*

The above illustrates how a Songo Songo married woman is required to devote herself to her husband and that her loyalty is to him before her kin. A married woman should avoid associating herself with suspicious and undesirable elements, as indicated in the narrative below:

> *Alternatively, if you know that he will not come back early then ask him the day before you want to go to a wedding, if he says no, do not ask why. Do not insist on going because he will become suspicious that there is more to it than the wedding and that will be the start of conflict. If a husband is happy with your trip and has no worries about your whereabouts, he will allow you to go or to do any business you want. There will be no conflict because he wanted you to go. However, if you force*

[99] Men are leaders and providers in the households

your husband to agree with you whether he likes it or not, you might end up divorced because you have made him mad. A woman is supposed to do things that please her husband, not otherwise. (Amina, Somo, 2009)

Confirming Amina's perceptions of how a married woman is supposed to behave towards her husband in the household, Khadija,[100]a young married woman, is not allowed by her husband to do many things that she used to do before being married. She is not allowed to sell food on the village pier, and her husband has imposed many restrictions on her:

My husband does not allow me to have friends; he says they will teach me bad manners. If I want to go and visit my parents I have to use the beach pathway, as he does not want me to walk on the road that passes through the middle of the Island. He says there is no reason for me to use that path, where many people can see me. I have to use the one along the beach because no one can see me there. (Khadija, a young wife, 2009)

Khadija obeys her husband's decisions because she wants to avoid conflict with him. Her perception of marriage and the correct behaviour of a married woman are influenced by her religion, social conditioning and upbringing.

Juma was forcefully married to his first wife after her brothers found them together in his house. His views of marriage and what a woman is supposed to do for her husband led him to divorce this wife after two years of marriage. He complained that she was not doing any housework, and he had to cook his own meals when he came back from work. Although he claimed that he agreed to marry her because he loved her, he had to divorce her because:

I always found her sitting doing nothing and she had no time for me and wanted to take the law in her own hands, meaning she did not want to be corrected even if she did something wrong; she did not listen to me. (Juma, guard, 2009)

Other men in focus group discussions supported Juma's argument about respect in marriage:

Divorce or marriage breakup depends on two people who have decided to live together. They must endeavour to respect one another, but if there is no respect, there is no marriage. If you see your wife openly showing you contempt you must

leave, but if there is respect and you respect one another you can live happily. (Jaka, mixed focus group, 2009)

My discussion in this section has centred on preparations for marriage, the marital contract and its implications for conjugal rights and marital expectations. In the next section I discuss divorce. In the literature on gender and intra-household bargaining, divorce is considered a definitive threat point. The causes for divorce in coastal Tanzania, including Songo Songo Island, are very important to understanding women's bargaining power in marriage, their fallback position and how divorce constitutes a meaningful threat point in the households of seaweed farmers.

6.2.4 Divorce

Islamic family law recognises three methods of divorce: *talaka*, or repudiation by the husband; *Khula,* or divorce by mutual agreement; and *Tafriq*, a judicial order to separate. Islamic law requires that the husband maintains his ex-wife during *eddah*, the three-month waiting period for women after their divorce (Nasir, 1990). In Tanzania *talaka* is the most common way for a man to announce that he wants a divorce (Kikopa, 1981). All three types of divorce, whether initiated by man or a woman, must be registered according to the Marriage Ordinance Act of 1971 to establish the end of the marriage. However, in rural areas the registration rate for both divorce and marriage is very low.

Although divorce is approved under both the Tanzanian Marriage Ordinance and Islamic law, it involves considerable provision for reconciliation prior to divorce through the village level local authorities, the Islamic council and the court of law. The 1971 Marriage Act requires that all divorces be made final in the civil court. A divorce is not finalised, however, until the couple has met with the state-run Marriage Conciliatory Board and there has been a court decree of divorce. The goal of this requirement is to reduce the divorce rate. According to Tungaraza (1995), 1.43 per cent of the population aged 16 and above was divorced in 1978 – by 1988; this percentage had grown close to 4 per cent, indicating that the legal requirements for obtaining a divorce have not decreased the divorce rate in Tanzania.

The Qur'an urges husbands to avoid divorce and try to preserve their marriage even if it is not ideal. This is to be done in the first instance by exercising patience with their wives' faults. The Qur'an says:

Live with them on a footing of kindness and equity. If you take a dislike to them, it may be that you dislike a thing while Allah brings about through it a great deal of good. (Qur'an 4:19)

The Prophet (PBUH)[101] emphasised the undesirability of divorce, as narrated by Abu Dau'd': "*The most hateful of all lawful things, in the sight of Allah, is divorce."* (Ali 2001:4). Muslim husbands are required to make full use of the Qur'anic provisions for reconciliation and arbitration (Qur'an 4:34) before proceeding with a divorce. According to the discussion with the Songo Song Sheikh If a man does divorce his wife; he should follow the steps approved in the Qur'an and Sunnah regarding a revocable divorce. This allows for cooling off and reconciliation before it becomes final. The divorce cannot be pronounced final while the wife is menstruating and must wait until she has finished menstruating and has not resumed marital relations with the husband (Qur'an 65:1). In other words, divorce is not to be pronounced in anger or at random, but at a specific time when the husband is in control of his reason and the wife herself is not in the state of emotional upset that sometimes occurs while she is pregnant or which accompanies menstruation. When divorced, the husband should continue to maintain his wife as before in their household until the expiry of her *eddah*, without harassment, (Qur'an 65:1, 65:6), making provision for her according to his means. He may not take back any of the gifts he may have given her before or during the marriage:

The parties should either hold together on equitable terms or separate with kindness. It is not lawful for you [men] to take back any of your gifts from your wives. (Qur'an 2:229)

On the contrary, the husband is to give his ex-wife a gift or some form of maintenance to sustain her after the divorce [Qur'an 2:241]. Moreover, he is not to interfere if, after the divorce, she wishes to marry someone else:

.....and when you divorce women and they have reached the end of their waiting term, hinder them not from marrying other men if they have agreed with each other in a fair manner. (Qur'an 2:232)

The reality in my research was different from the Islamic teachings and the Quran, as I show in section 6.4 where women share their experiences of their breakdown position on Songo Songo Island. Apart from women being able to marry after being divorced, issues such as

[101]Peace be upon Him

maintenance during *eddah* and claiming her assets are not normally practiced, as customs and norms take the place of religion in this society.

The coastal Swahili people have historically been recognised for their high divorce rates, and multiple marriage over the life course is described as very common (Gomm, 1972; Landberg, 1986; Middleton, 1992). According to Amina, a respected Songo Songo elder, the islanders marry and divorce according to Islamic law. If someone says she does not want her husband, the husband will know that his wife does not want him; he will start to look for the causes of their conflict and present his concerns to the elders[102] or they will go to the village government, and if they fail in all these places he will divorce her. Women on Songo Songo Island can also go to their natal homes, their husband's kins or the *Mshenga* to seek divorce from their husband. They also can go to the village government to settle their grievances if they have failed in the kinship reconciliation. This argument was supported by men in a focus group:

> *A divorce in a marriage occurs if a man brings in another woman or a woman brings in another man; there is no tolerance of this. Other issues can be tolerated, as they are considered human limitations. (Daima, mixed focus group, 2009)*

> *In coastal areas and amongst us Muslims, the big issue that can break a marriage is infidelity. When you find your wife with another man or your wife finds you with another woman that can break a marriage, but other things can be discussed. That is why we coastal people do not divorce easily, because when you say you want to break the marriage, your parents will come and correct the situation. However, when it reaches the point of infidelity it becomes very hard for them to come to you for reconciliation or to stop you from getting a divorce*. *(Jaka, mixed focus group, 2009)*

The issue of masculinity became evident when I asked why women tolerate infidelity while men cannot:

> *Because I might know the person who had an affair with my wife, as this is a village and people know one another. On the other hand, I might find my wife with a person from the camp and I will be hurt because this person is an outsider and might be infected with HIV virus. Apart from HIV it is more painful knowing that I am poor and he is rich and has more money than I have. (Jaka, mixed focus group, 2009).*

[102]Parents and relatives from both the husband's and the wife's side.

The power play between men from Songo Songo Island and immigrants who work at the gas plant, locally known as 'the camp', became evident to the extent that some men indicated that they would divorce their wives if they insisted on working at the camp, as indicated in section 6.3. According to Songo Songo's *Somo* Amina, divorce is a way of preventing conflict when people are not on good terms; if they divorce and live separately there is no chance of their fighting.

Although Songo Songo men or women can initiate divorce, men have more power, as according to Islam they must only pronounce the words "You are no longer my wife" or "I divorce you" three times (Songo Songo Sheikh, 2009). Major reasons for which men can divorce their wives are adultery, infertility, desertion and denial of sex. According to Islamic law, a couple can be reconciled after first and second divorces and live together again as husband and wife (Songo Songo Sheikh, 2009). However, if a man has already divorced twice, the third time is his last and he can no longer be reconciled with his wife until that woman marries and divorces another man (ibid). Although Islamic law recognises the pronounced divorce, women whom I interviewed who had experienced divorce or the threat of divorce asked for a written divorce witnessed by a third party. For instance, Mwanahariri refused to go back to her natal home without a written divorce. This is discussed in section 6.4, where I discuss particular cases in detail.

Islamic law also gives a wife the right to divorce through *Khula* (female divorce) which entails buying her way out of marriage by paying back the bride price. In Tanzania, men sometimes refuse to accept a woman's *Khula* or divorce and thus force the National Muslim Council of Tanzania (BAKWATA) to offer the woman a divorce. A woman is also allowed to ask for the annulment of her marriage if her husband has failed to provide for her or in the case of desertion, cruelty or impotence. However, on Songo Songo Island women rarely practice *Khula* due to patrilocal norms. Apart from the choice of going to the court of law or to BAKWATA for a divorce, the answer I received from all the women I interviewed indicated that the husband is responsible for giving a wife a divorce. All four women who had marital problems and wanted to break off their marriage, or had broken off their first marriages, had asked their husband for a divorce. *Khula* divorce also involves travelling to the mainland to see the BAKWATA sheikh, who puts the marital couple through a reconciliation process before allowing a divorce.

Songo Songo men felt threatened and their masculinity was challenged by women's increased income from seaweed, which improved their fallback position in their marriage. The women used divorce as a threat point when the seaweed farming was on the rise, as

the income made it easier for them then to initiate divorce. However, cultural norms and fear of what society might think of their behavior, caused many women to stay in their marriages despite the abuse and difficulties they experienced. Men also use divorce as a threat point as for them it is a matter of simply pronouncing the appropriate words, as indicated above. Maimuna's husband threatened to divorce her, but did not follow his threat through.

In this section I have discussed the conjugal contract including marriage, the socialisation process and divorce patterns on Songo Songo Island, setting the foundations for my discussion of women's contribution to their households. The concept of *Qawamuh,* which gives women the bargaining power, is crucial to understanding the impact of women's contributions to their households. I discuss women's contributions to the household through their informal economic activities, emphasising seaweed farming, by examining the impact of their contribution of income on gender relations in their households both when the seaweed was on the rise and when it had declined.

6.3 Women's contribution to household income: The impact of seaweed farming on gender relations

Using the conceptual approach outlined in Chapter 2, this section examines how far income earned by women from seaweed farming is linked to their actual and perceived contributions to the household, and how this has influenced their decision-making and bargaining positions. It also illustrates how the gendered division of labour influences men and women's household decision making.

In this section, Sen's element of perceived and actual contribution response is used as an analytical tool to examine the impact of women's financial contribution to their households from their seaweed. Sen (1990) emphasises monetary earnings in the cooperative conflict model. According to him (ibid), the success of the household depends on the totality of various income activities such as cash income and purchasing food and other items for the household. Sen's model is instrumental in understanding how the incomes of household members have shaped intra-household gender relations in seaweed farming households.

Although I asked the respondents about money earned over the past month in order to understand how the seaweed farming had declined, I did not ask about money spent by the households in the survey and semi-structured interviews, because in this research I had no intention of measuring household income or observing quantitative income differences between men and women. Secondly, it was not easy to get accurate accounts of the amount of money spent daily or monthly by households, due to people's sense of privacy,

perceptions of wealth and poverty and how they portrayed their households to the community. Besides, I did not need this type of data. If necessary, I could use the price of items at the village shops and market to approximate the amount of money the women spent as their contribution to their household.

Sen (ibid) argues that a person who works outside the home or produces income for a household in some other way holds greater negotiating power in the household than one who works within the household, because he/she commands higher respect and is less dependent on other household members:

> *When work is done outside the home and the employed woman earns a wage, her contribution to the family property is more visible. She also has more voice, because of being less dependent on others (Sen, 1999:194).*

However, the employability of Songo Songo women is restricted for various reasons, including the socially-constructed gender bias and their reproductive role, which includes unplanned births and childcare and overburdens them to the extent that they have little time to engage in productive activities outside the home.

All the seaweed farmers interviewed said that they contributed to household income by meeting all or part of the cost of food, incidentals and their own clothing. Their contribution to the household at the time of my research was small compared to when they were earning an income from seaweed.

Most of the men I interviewed told me that their wives' income was less than what they earned themselves. It was not easy to ascertain whether or not this was the case, as they sometimes exaggerated their earnings to make themselves feel important. A wife's contribution to the household is seen as 'helping' with the households' expenses, even if she contributes more than her husband, as seaweed farmers do during the *Kusi* season (see chapter 5), when men cannot go fishing due to strong winds.

> *He hasn't asked or forced me to buy anything – however whenever I see that he has brought rice without spices or onions, or if he hasn't left me any money, I take my money and buy whatever I need for the day. (Asha, young women's focus group, 2009)*

> *All household needs are supposed to be met by our husbands, according to our religion; however due to economic hardship we have to help one another. When we*

buy household items we do it willingly; it is not compulsory. We also use our money to buy stuff because men cannot afford to fulfill our needs. (Chiku, seaweed farmers' older women's focus group, 2009)

We don't have to give them our money; they are responsible for everything in the household. (Asia, young women's focus group, 2009)

During Kusi*, because of the strong winds the men do not go to the sea, therefore we are responsible for our households. (Zaina, young women's focus group, 2009)*

When my husband comes back from fishing empty-handed, I take my money and help him to buy what the household needs. Sometimes he goes fishing for three or four days and comes home with nothing. (Mariam young women's focus group, 2009)

You may find women going to the reefs, and if they are able to get octopus or sea cucumber or molluscs to sell they might help in the household by buying turmeric or sugar. But to say that women contribute a lot of money to take care of household affairs is not entirely true. (Mbulula, fisher, 2009)

The above descriptions of their contributions imply that the women know the value of their input into their households' welfare. They also know that this puts them in a favourable position, as they are not seen as women who sit idly at home and help with nothing. When I asked them if men consider themselves responsible for everything and that the women are just helping them to fulfill their responsibilities, the women responded:

Some men see, some pretend not to see. (Chiku, seaweed farmers older women's focus group, 2009)

Sometimes they see that we are helping them, and others do not see our help. (Asia, young women's focus group, 2009)

It is not that they do not see, but that they pretend not to see. (Mariam, young women's focus group, 2009)

The men claimed that the women only supplemented their husbands' efforts to supply their households with basic needs. They see themselves as expected to earn more money than women. This might explain why they resorted to seaweed farming, hijacking the trade when their wives were earning more income from it than they earned from fishing (see Chapters 4 and 5). Men also engaged in octopus collecting, normally considered a women's activity, in

the hope of earning more money from it and fishing than they did by fishing only. They resorted to these activities as a means of restoring their status in the community, which, they felt, had been challenged by the women's earnings and autonomy.

6.3.2 'My money is the source of conflict'

The negotiation of gendered responsibilities at lower levels of overall income is likely to lead to gender conflict. There are gender tensions over women's new earning opportunities from activities such as seaweed farming, especially if men's income is not increasing or is declining due to pressure on marine resources. Women reported that domestic conflict rose as men lost their role as the household's sole breadwinner. Women's time use also causes conflict, as their increased work farming seaweed leaves them with less time for household and childcare tasks. I asked a male respondent where the women of his household were during one of my field visits, and his response was: "They have gone to their second husbands", revealing his and other men's resentment about the fact that the women spent a lot of time in the intertidal areas tending their seaweed instead of seeing to their household responsibilities.

Accusing women of unfaithfulness is used as a way of preventing them from engaging in economic activities, earning income of their own and gaining autonomy. Discussing women's income-earning activities and access to natural resources at a focus group with women over 35, Bi Mbeyu explained that although women seek permission from their husbands to access the intertidal areas, sometimes the money they get from octopus causes trouble as the men pretend not to believe that they collected the octopus themselves. This happens when they refuse to hand over the money to their husbands, who accuse them of promiscuity and unfaithfulness:

> *That money will give you big trouble, a man will talk about your money, which you got by working hard in the sea since morning; however you will not be happy with the money. You will forget about last spring tide when you came back from the sea, when you were insulted, beaten, and a man will say "Do you think that money came from selling octopus? You got it from other men, you have your ways: men collect octopus and you follow behind collecting them, then you come back to the island to sleep with them". But that was not the case – I collected the octopus myself, I walked on the reef, saw the octopus and collected with my own hands, my own hard work*. *(Bi Mbeyu, seaweed farmer and octopus collecter, 2009)*

Maimuna's husband, an incomer to the island, learnt fishing from his father-in-law and how to collect octopuses from his wife. Maimuna went to the intertidal areas and the reefs even when she was pregnant, but stopped after giving birth. She started her fish-processing business when she was pregnant with her second child, could not go to the intertidal areas and was not getting enough money from her husband for the household's needs. Her husband accused her of promiscuity when she sold fish at Funguni, claiming "*umalaya tu hakuna biashara yoyote*", literally meaning "there is no business, just prostitution". Because of his suspicions he ended up beating her while she was pregnant. She went back to her parents, where she was reconciled with her husband without him explaining the reason for the conflict to his parents-in-law. According to Maimuna, her husband did not understand the kind of business she was engaged in, which enabled her to make "so much" money, because he felt that as the breadwinner he was supposed to be making that much money himself. When the seaweed farming started, Maimuna and her husband worked together and used the money from the seaweed to buy lime to construct their house, which had been damaged by a tsunami in December 2006. Maimuna's husband was also employed by ZASCOL Company to buy seaweed from other farmers, and he made a lot of money, which he wasted. With the seaweed money coming in and a boom in her octopus collection and fish processing businesses, Maimuna was making more income than her husband. Due to her husband's bad temper and accusations, they did not pool their income. Her husband accused her of promiscuity and pride because she had made more money than him, and of not showing him respect, resulting in much conflict in their household.[103] She earned between 12,000[104]and 15,000 TZS selling octopus and 40,000 to 60,000 TZS selling seaweed per spring tide. When she brought the money home her husband beat her and chased her out of the house, telling her "*haya nenda kwenu*".[105] Maimuna marital conflicts were caused by her income, as is evident from the men's comments in the focus group discussions (see 6.3.4). In spite of the money she had made, she ended up not knowing how to improve her life. Maimuna's situation was not peculiar to her, as confirmed by other women in focus group discussions:

> *Others failed to progress with their seaweed income because they were restricted by their husbands. (Fatuma, seaweed farmer, 2009)*

My findings from this study indicate that although women on Songo Songo Island started to earn an income in their natal homes before marriage, the socialisation process that taught them that the final decision lies with their husband led to their perception that they need

[103] Mariam was married to her cousin after his first marriage failed, based on an accusation of promiscuity.
[104]The exchange rate in 2009 was approximately $1= 1200 T Shillings
[105]"Now go back to your natal home."

men's guidance in financial planning and budgeting. While Maimuna was repeatedly beaten and abused by her husband because of her income, she continued to show him her money and did not plan, save or do anything progressive with it:

> *I did not know what to do or where to keep my money. (Maimuna, seaweed farmer, 2009)*

Other women had the same experience. Bi Mbeyu, a focus group participant, claimed that she showed her husband where she kept her money under the mattress, and when she looked for it later but could not find it he beat her for asking where it was:

> *I can keep my money earned from the seaweed or from the reefs and tell my husband that I am putting my money under the mattress. He will later deliberately spend the money because, as he puts it, "A hoe has gone to work".*[106] *He will wait until the spring tide, when I have accumulated some money, and he will say: "My wife, there is no soap. I'm going to buy some soap". He will take some money and go; I will not see him until the evening. Eventually, he will take all the money I have earned from the reefs and hide it in a place known only to him. All that money will be used to buy just half a kilogram of flour or a kilogram of rice and the rest of the money will not be accounted for, because it has been given to other women while my children and I suffer. If I voice my concern about his behaviour he beats me up. (Bi Mbeyu seaweed farmers' older women's focus group, 2009)*

Maimuna's husband stopped farming seaweed with her as soon as he started making his own income from the Seaweed Company, which employed him. Although he kept providing money for household expenses, he started to have affairs with other women on the island, as highlighted in section 6.4.

Women's use and control of their own income is a contested issue on Songo Songo Island as it has led to men becoming suspicious of and distrusting their wives. They suspect them of going to the reef or the market ostensibly to sell fish or other snacks, but in fact to engage in prostitution. There is also conflict about whether women ask their husbands' permission to travel to their natal home or to work in the intertidal areas. This shows the extent to which decision-making has become a contested issue in households:

> *Others are praying for seaweed farming to decline because it brings trouble. There is a problem; once she gets money she never stops travelling, and because of that, I do*

[106] A tool (i.e. Bi Mbeyu) has gone to work and has brought in income.

not see the importance of that money in my household. She will say, "My husband, I want to go to Kivinje", and when I tell her not to go, she retorts, "Ah, are you the one giving me the money? I have my own money". I may give her permission to go but in my heart I am not happy. Therefore when I hear that the seaweed is dying, I keep praying that it will keep dying, because then there will be no more travelling.

People are saying that houses hold secrets: you see people travelling to Kivinje, Mtoni and to other places. All these places they go to, maybe they go to buy witchcraft and other worthless things. You know women – you cannot say anything that will make them listen to you, especially when they have money. The best thing to do therefore is to ensure that they never have their own money – that's when they listen to you! (Abdul, young men's focus group, 2009)

My findings imply that women's engagement in livelihood activities such as the seaweed farming and their subsequent contributions to their households might be linked to their interest in obtaining and maintaining negotiating power.

6.3.3 'Money borrowed is never returned'

Halima, a seaweed farmer, started going to the reefs for octopus before the seaweed was introduced, then her husband forbade her to go for the simple reason that he could not go fishing on the sea while his wife also worked. When she started going to the intertidal areas to farm seaweed he forbade to do that as well. However, she would occasionally sneak out to work without his permission. When he later saw the money she was making from the seaweed he changed his mind:

At first he said I could not go to the reefs. I stopped. I watched people going to the intertidal area and coming back; later on when he left the house, I went there. When he saw the money I made from seaweed farming, he joined in. (Halima, seaweed farmer, 2009).

This shows that gender relations are not rigid but subject to change, and require active maintenance. Songo Songo men and women have always negotiated access to and control over income, assets, labour and other productive resources. In these negotiations they deploy symbolic and cultural resources (Whitehead, 2001). Halima, who farmed seaweed with her husband, had to split their farm after a disagreement about the distribution of the income:

In the beginning we were farming seaweed together. We continued up to a point when he saw that we were sharing the seaweed income equally between us. Because he is a man, he thought he was supposed to get more money than me. Because of this, conflicts often arose, and so we decided to plant seaweed on separate fields to prevent this, but he came to help me whenever I harvested my seaweed. He definitely knew when it was time for me to make some money. (Halima, seaweed farmer, 2009)

When I probed to find out why her husband thought he should get a greater share of the seaweed money, Halima responded that it was because he is a man. She added that according to custom the man must get more of everything than the woman, even though his input was low as she was the one who did most of the work on their seaweed farm. Although they had reached an agreement to divide seaweed plots, she ended up helping her husband to tend and harvest his seaweed:

I harvest and take his seaweed to the beach, dry it and hand it to him saying; `Here is your seaweed`. Once he sells his seaweed he does not give me a single cent unless I steal it. (Halima, seaweed farmer, 2009)

Yes, I must give him money because he is the one who goes and sells the seaweed, so when he comes back I give him money to avoid conflict. If I do not give him money he will say: 'She did not give me a single cent from her seaweed', so to avoid a fight, at the soonest possible moment I give him money. But when he sells his seaweed, he doesn't give me any money unless I go and harvest his few ropes and dry them. (Halima, seaweed farmer, 2009)

Elsewhere in Tanzania, for example in Mtwara, women gained less than men during the "honeymoon period" when cashew nuts brought in a lot of income, because men control the sale of the nuts and the income. They negotiate prices with the buyers and women have little idea of how much has been sold and at what price (Action Aid, 2004). The Songo Songo Island women, however, know the price of seaweed because it is fixed. Men who took their wife's seaweed to the selling point brought back the correct amount of money for the seaweed sold,[107] but then borrowed it from their wives, waited to be given their share from the sale or took it from where their wives kept it, as explained in the female seaweed farmers' focus group:

[107] The seaweed buyers give them an official receipt showing kilograms of seaweed sold and the amount of money paid.

If you lend him money, you will never get it back …He knows I will not say anything and if I speak up he will say, "What kind of a woman claims her money from her husband?" Do you think without me feeding you rice which I got from going to the sea, you would have the energy to go to work? That is why I did not give my husband any of my seaweed money. (Bi Mbeyu) seaweed farmers' older women's focus group, 2009)

"Lend it to me, lend it to me" – the men often come begging, but when you do, the money never returns, he has used it and you can't claim it back from him. (Fatuma, seaweed farmers' older women's focus group, 2009)

We don't show them our money because once you show him he will ask you to lend him money, like 2000 Tanzania shillings, and promise to pay you tomorrow. If you lend it to him, Innallilah,[108] *what remains is conflict (Chiku seaweed farmers' older women's focus group, 2009)*

You do the hard work, but when you get your money you do not see it, a man has put it in his pocket and will end up giving it to other women. That way you cannot progress at all. If you want to buy a sofa, you can't because a man has put your money in his pocket and at best you just end up complaining. (Zaina seaweed farmers' older women's focus group, 2009)

An informant indicated that her husband often volunteers to assist her when he is aware that this will enable him to get some money:

My husband does not help me in the field, but when the seaweed is dry and ready he helps me take it to the selling point, claiming that it is shameful for a married woman to carry a heavy load around the village when her husband is around. However, after selling my seaweed, he borrows my money and never pays it back (Seaweed farmer 3, 2008).

With their own well-being improving, Songo Songo women gave money to their husbands to maintain their marriages:

He does not know what I am earning and I do not show him. He just asks me to give him 2000 or 3000 Tshillings to buy something, and I give it to him. (Asia, young female seaweed farmers' focus group, 2009)

[108] "Truly we belong to Allah", used to express the extent of the conflict when she asks for the money back.

The focus group discussions with women of all ages provided useful data on the subjects of marriage, divorce and unequal relations in the household. When they complained about the money they lent to their husbands I asked them why they continued to lend it when they knew there was little chance of getting it back. Their response was that they did it to ensure harmony in their marriage:

> *You want harmony and cooperation in your marriage, so you give your husband money if you want him to cooperate with you. (Chiku, seaweed farmers older women's focus group, 2009)*

The women had to cooperate with their husbands' demands and behaviour even though they were unhappy about it. These women were creating and maintaining peace and harmony in their households so that they could continue to access the marine resources for their livelihoods

For a woman who is a wife as well as a farmer, the cultural context of conjugal expectations and what is seen as legitimate grounds for deviation are very important. It also matters how a woman's place in relation to her husband and in terms of relative income control, status, social regard, role performance, and many other factors that balance shared and separate interests, affects gender relations in the household (Jackson, 2007:113). Women on Songo Songo island claimed that when they did not give their money to their husbands they were denied their conjugal rights as punishment, as discussed by Bi Mbeyu in seaweed farmers' focus group:

> *A husband for two to three days,* jojo yake mwenyewe[109] *simply because the day before yesterday he asked you to give him money and you refused; so he will also deny you sex. He will pretend to be angry and refuse to have anything to do with you sexually. He will go in and out of the house abusing children; his own children will be pushed away. (Bi Mbeyu seaweed farmers'older women's focus group, 2009)*
>
> *When you go to sleep, he will turn his back on you because you have not given him money. If this is the third day, on the fourth day you give him money and he will be very happy. Then you will know that money, which you refused to give him, was the reason for his behaviour. However, with young women if a man becomes angry, they will say it's up to him, they don't care. (Bi Mbeyu seaweed farmers'older women's focus group, 2009)*

[109] She uses this expression to describe his conjugal right to have sex with her a woman can never deny her husband sex when he wants it; however a man can deny his wife sex as a form of punishment.

This recognises that relations between spouses, for example of conjugality, are important mediators in individuals' preferences and actions (Jackson, 2007). It also suggests that intra-household bargaining power on Songo Songo Island is significantly determined by cultural beliefs and gender ideologies (Whitehead, 1981; 1984). These social constructs of gender give different power to women and men to act out in their daily lives (Whitehead, 1984). Therefore it is difficult to suggest that gender inequalities within households are determined only by economic power, as some women had no control of the income they earned from farming seaweed and others were abused by their husbands because they were earning money.

6.3.4 'When she has money my voice becomes small'

In focus group discussions, women seaweed farmers aged 35 and over claimed that men thought their behaviour had changed due to their income from seaweed, while in fact their status had changed while men's status remained the same. They cited examples of times when they had had to beg their husbands to buy them clothes, and might end up with just one dress for the whole year. With their own income from the seaweed they were able to buy clothes for themselves and their children. When they also bought food for their households, their husbands saw it as a lack of respect. According to the women, men denied them food as a weapon to mistreat them in what is referred to locally as *anataka kukuacha na dhiki.*[110] The men decide when and how much money to give their spouses. The autonomy women had gained improved their self-interest and stregthened their bargaining position as they no longer had to wait for their husbands to buy them food and clothes. One woman claimed:

> *...my husband did not recognise me in the street as I was in new clothes and looked good. (Bi Mbeyu, seaweed farmers'older women's focus group, 2009)*

Smith and Chavas (1999) use International Crop Research Institute for Semi Arid Tropics (ICRISAT) data to explore the potential effect of intra-household gender relations on cotton production in West Africa. Their model assumes, however, households with monogamously married couples, and indicates spheres of both separateness and interdependence in household farming. It posits a conflict between husbands and wives derived from the fact that although cotton requires both female and male labour, women get little or no income from it because it all goes to the men. This is different from seaweed farming on Songo Songo Island, where the women use their own labour in the farming and are able to own and

[110] He wants you to be hard up.

control their own income, causing resentment from the men, some of whom claimed that it would be better if the seaweed continued to decline:

> *For instance, when she has money, although you have a voice, you will be afraid. You will be scared to tell her anything; you know she's your wife but you can't talk because she is the one who has the money. Your voice becomes small even though you're the one who owns her. You have the power to ask her anything, but on that day your voice becomes small while hers is big. That is why we say it would be better if the seaweed died. (Abdul, young men's focus group, 2009)*

> *Because you do not have income and the woman is the one with income, you will be dragged along and have no command over her. There should be a law that requires that when a woman has wealth, the one who should own that wealth must be a man, and he should control that wealth for whatever reason. Our ancestors followed that kind of reasoning, so why can't we do it now? (Jaka, mixed focus group, 2009)*

> *I agree with [another participant] that if there are 200 women, only 50 of them can agree with their husbands on the use of their income, but when these remaining 150 have income they make their own plans about what they want to do with their money. (Shaka, young men's focus group, 2009)*

> *There are a few who sit with their husbands to discuss their income, and if a man wants to control a woman he should control her income because once a woman's income is controlled by a man he can direct her in any way he wants. (Shaka, young men's focus group, 2009)*

Women's increased earnings have bolstered their self-respect but damaged that of their men. A male respondent said:

> *Nowadays when a woman has her own wealth and you have nothing you become useless; you will be called "*kinyama cha mwitu tu"[111], *Any time you do something that displeases a woman she will let you know that you do nothing and so you have nothing. At the same time she will remind you that she has her own money and so*

[111] "As worthless as an animal".

*she could decide to find another man "*aweke ndani"[112] *if she wishes.* (*Jaka at mixed focus group, 2009)*

Men also expressed fear of not being respected by women who have their own income. This fear is associated with women making their own decisions and forgetting that the final say rests with men. However, they still allowed their wives to collect octopus or farm their seaweed and to engage in other income-generating activities, as their income contributes to the maintenance of their households, especially during the season when they cannot fish.

All the examples above support the claim that contributing to household resources is one of the factors that influence negotiating and bargaining strength within a household.

6.3.5 Making decisions

Perceptions of women's earnings and contributions to household expenses affect the relationship between a wife's decisions about the use of her money, her earnings and her financial contribution to the household and how that is reflected in the traditional sexual division of labour. Bruce and Dwyer (1988:1) state that "men's and women's economic contributions tend to be differently valued by others and self, a circumstance that generally works to a woman's disadvantage".

The literature on intra-household relations shows that couples do not pool all their income; household expenses are paid for by the husband and the wife and there is a divided expenditure responsibilities between spouses and different decisions about money that depend on social gender norms (Bruce and Dwyer 1988).

Men on Songo Songo Island explained that their wives decided on the use of their own income, as indicated in quotes from the men's focus group in 6.3.4 that illustrate men's views about the control in decisions about the use of income in their households. A sizable minority of decisions are taken jointly, with others taken by men or women alone. For instance, men are considered head of the household and have absolute control over decisions that affect the whole household (Lyimo-Macha and Mdoe, 2002). Women reported having access to income before they farmed seaweed, but did not have full control of it, as they sometimes had to decide with their husbands how the money should be spent. There is however, a significant degree of both joint and female control over some income in some cases:

[112] Culturally a man is the one who marries a woman by paying a bride price (see section 6.1).*Aweke ndani* literarily means a man marrying a woman and live with her in his house, so a man spoke with disdain that a woman can marry a man.

If you have been cooperating with her by showing her your income so the two of you can decide how it should be used, then all well and good; when she also gets her income she will not break that habit because when you got your income you showed it to her. Therefore when she gets her income she will bring it in and say, "My husband, this is my money from the seaweed", and nothing will go wrong. However, if you like to hide your money from your wife, she will equally not show you her money whenever she gets it. This situation often leads to suspicion and conflict in the household. (*Jaka, mixed focus group, 2009)*

Although the women claimed that decisions are shared and that men and women often discuss decisions and later come to an agreement, the men claimed that they had the final say. Young men expressed the view that they were the decision makers in their households:

A man is the one who makes the final decision in the household. (Shaka, *young men's focus group, 2009*)

I am the one who keeps the family's income; I make decisions in my household because I work for my income, and I'm the one who keeps it. When I wake up in the morning, my wife puts out breakfast and then I give her money for the day's expenses before going out to work. (Madani young men's focus group, 2009)

I'm the one who makes the decisions, although there are some things that we sit down and discuss. I might go to work, get money, and give her money for our weekly or monthly expenses, then I ask her to save the rest. I also put aside money for my own use without her knowledge. (Khatibu young men's focus group, 2009)

If she wants to visit her relatives at her natal home, she has to inform me first, then I decide whether or not to allow her to go. If there are any compelling reasons against it I will not allow her to go. (Madani young men's focus group, 2009)

Women had some autonomy when the seaweed was thriving, and made their own decisions regardless of the men's feelings about it:

Those were the days when I was very independent! I could go anywhere whenever I felt like it. I just asked for permission to visit my relatives. Even the way I asked for that permission was different; it was just like informing my husband that I would be travelling to a wedding or visiting some relative of mine without asking for money for

the fare, as I had my own money. However, nowadays I need to ask for the fare as well as permission to travel. (Seaweed farmer1, 2008).

The above findings are relevant in the extent of decision-making power that women have in intra-household negotiations due to their income from livelihoods such as seaweed farming. Women on Songo Songo Island used the power of their income to improve their negotiating position and their well-being.

Tatu, a young married woman, occasionally sells snacks. Snacks and other businesses depend greatly on the success of seaweed farming, as I indicated in Chapter 4 on livelihoods. Tatu does not go to the intertidal areas because she is caring for young children; however, whenever she has money from selling her snacks she shows it to her husband and asks for his suggestions as to how she should spend it. Her husband decides how much she should spend on herself and how much she must spend on the household, and his decision is final. He also shows her the money he has set aside himself for the household, and asks for her suggestions on budgeting and expenses. In this way they have learnt to coexist without conflict over with their earnings.

Maya, who has a fish processing business, always discusses and plans with her husband what they should do with the money she gets from her business and from her husband's fishing income (for more on Maya's household's livelihoods, see Chapter 4).

The two cases above show how frequent pregnancy and constant child rearing make the outcome of co-operative conflicts less favourable to women due to their worse breakdown position, less ability to make a significant contribution to the household's income and greater dependence on their husbands, which impacts on their power in decision making.

In this section I have illustrated the changes caused by seaweed farming which have led to an increase in women's income profile resulting in changes to the marital relationship. In the next section I examine the impact of seaweed farming on Songo Songo women's breakdown position. It is not easy to compare seaweed farmers with non-seaweed farmers because most of the people interviewed had farmed seaweed when it was on the rise, and because the livelihoods or income-generating activities of the non-seaweed farmers on the seaweed farmers' increased purchasing power. The comparison between when the seaweed was on the rise and its decline allows examination of what has changed in spouses' bargaining and negotiations, and how this is linked to decisions about money. Agarwal (1994:62) says that a rural person's fallback position depends, among other factors, on access to employment and

other means of earning an income. The evidence from the field presented above shows what women could do when they had an income from seaweed and what they were not able to do when that income declined with the seaweed.

6.4 The Breakdown Well-being Response

In this section I discuss the breakdown position, or the outcome of spouses' failure to cooperate in Songo Songo Island households. The perceived and actual or observed well-being of an individual, which determines his or her decision to stay in or end a marriage, are shown using data from the semi-structured and unstructured interviews.

According to Sen (1987), when two cooperating individuals in a household come into conflict or face a breakdown position which will make both worse off, they consider options that would be better for both of them than breakdown. Of these various alternative solutions, some may be worse than others for both and some may be worse for one and neither better nor worse for the other, thereby giving one person the chance to dominate. Such solutions will be rejected until two alternatives emerge, one of which is better for one individual and less attractive for other though better than the breakdown position. This is when the individuals face simultaneous cooperation and conflict. The solution chosen in preference to the breakdown position is the breakdown well-being response, and depends on the bargaining strength of the individuals concerned. The question arising now concerns how clearly the cooperating individuals know their own bargaining strength, and how they compromise between what they feel is better for themselves and what is expected by their society.

The breakdown position represents the wellbeing of individuals in the event of divorce or a breakdown of cooperation. It illustrates the vulnerability or strength of a person in the bargaining process. If the breakdown of negotiations would have disastrous consequences for a person because of his or her weaker breakdown position, he/she may be willing to accommodate the other person's interests in order to save the negotiations from breaking down, giving the latter the upper hand at the former's expense. An individual with a strong breakdown position has stronger negotiating powers and will achieve a better wellbeing outcome (Sen, 1987; 1990). The breakdown position therefore indicates the extent to which a person is willing to bargain in the face of the material and social implications of divorce for him or her. I show these differences by analysing the breakdown positions of Songo Songo seaweed farmers.

6.4.1 Women's breakdown position: the impact of seaweed farming

In this section I look at the breakdown position of seaweed farmers when the seaweed farming was on the rise and when it was on the decline. I found that cooperating individuals in households know their bargaining strength and compromise due to socio-cultural expectations. It is not about what they feel is better for their own wellbeing (Sen, 1987); for instance, while men may have the power to initiate divorce (see subsection 6.2.4) they may opt not to do so for the sake of young children or because society will perceive them as having no patience and failing in their households. Khatibu asserted:

> *If you do not value the meaning of marriage as God's instructs, your marriage will not last. You will marry and divorce, marry and divorce, because of your bad manners. (Khatibu, young men's focus group, 2009)*

Both women and men value on their children's well-being more than their own. A woman may accept her husbands' infidelity because she has no means of supporting her children alone, and a man might tolerate his wife's bad behaviour or even her infidelity if their children are young, waiting until they are old enough to take care of themselves before initiating divorce, as indicated in a men's focus group:

> *I have a wife and children. When I think of divorcing my wife I know my family would face difficulties, and I will wait until the children grow up. When they grow up enough to be able to take care of themselves I will divorce her. However it is difficult, because she is the one taking care of our family. (Khatibu, young men's focus group, 2009)*

The well-being of both men and women is therefore tied to that of their children. Women in Songo Songo have three options in the case of dispute: to continue with the marriage or to opt for divorce. They can seek divorce in a primary court of law or through BAKWATA, or attend reconciliation meetings organised by two parents of the married couple (see section 6.2.4). However, the social status of a married woman who is seen as having the security of a husband and a roof over her head, compared to that of a single woman who is considered *mhuni*, might influence her decision to stay in her marriage, as in the case of Maimuna illustrated earlier. The option of being able to initiate or ask for a divorce, social cultural conditions that do not stigmatise the divorcée and the chance of remarriage influence such decisions.

Mwajuma was married in 1982. When I interviewed her for my pilot study in August 2008, two months after her divorce, she had not finished her *eddah. S*he was staying at her father's house, which I found her renovating and thinking of taking on as her own. She regretted the time wasted constructing her marital house. I was lucky enough to interview her again in 2009, when her household was one of a random selection. She had been in a monogamous Islamic marriage in 1982 with three children from that marriage, and in 1995 her husband married a second wife. Before she became involved in seaweed farming, Mwajuma's livelihood had depended on her artistic work painting mats, *makawa* (food covers) and baskets and embroidering bed-sheets. After the seaweed farming was introduced on the island Mwajuma became fully involved in it. She used her income from the seaweed to open a small restaurant in the centre of the village, close to the primary school and the village and ward government offices. In this strategic location she was given contracts to supply food by the Kilwa district officers and mainland NGOs visiting the island for seminars and meetings. She bought livestock as savings using her seaweed money. Kesi, Mwajuma's ex-husband depended on ferrying people from the island to the mainland for his livelihood. Mwajuma was looked up to and has become the talk of the village, as she dared to do what other women are afraid to do due to social norms and conditions.

Mwajuma contributed her seaweed money to the construction of their new house and used half of it as a restaurant: *"I got the capital for my restaurant from seaweed money".* She divided her time between her seaweed farms and her restaurant. Box 6.1 tells her story:

Box 6.1: Mwajuma's Narrative

We divorced because my ex-husband) had spent all my money from my seaweed, which was my business capital, and left me with nothing. When he took all my money and my stuff and gave them to my co-wife I decided to ask him for a divorce and go back to my natal home.

He agreed to divorce me. However I did not agree to go empty-handed; I took him to the village government office, where he agreed in writing to pay back my money and other things. I am giving him until August to pay; if he does not pay I will go to the court to claim my rights.

What I am claiming from him is the house,[113] my livestock, which he sold without my knowledge, and payment for the work I was doing in the restaurant. He was paying 500 TZS per day to the other people who helped in the restaurant; that make 15,000 per month. I was paid nothing, apart from the food and other expenses for the house, so I want him to pay me for all the time I worked in the restaurant.
(Mwajuma, seaweed farmer, 2009)

After her divorce, and with her business taken from her, Mwajuma concentrated her efforts on seaweed farming and occasionally on collecting octopus. Her breakdown position before the seaweed farming was weak compared to when she farmed seaweed. Even since the decline of the seaweed, Mwajuma has been able to live on her own on her seaweed money, and her coping strategy in times of hardship involves getting food on credit from her brothers' shops. She also gets support from her father, who has given her livestock and helped her with the renovations of her house. Mwajuma's children are grown up and do not depend on her much. Apart from support from her natal family, Mwajuma has support from friends and other women through financial groups such as *Kikundi* and VICOBA (the village community bank) in the village. With all this support from her social and financial networks, Mwajuma has been able to continue with her life as she put it: *"The way I see myself, my divorce didn't knock me back because even when I was married I was buying my own food and clothes".*

On my second visit to Mwajuma's household I asked about the claims of her assets, and she told me that although her ex-husband had signed the village government document he had not paid her anything. She had decided to take the matter to the ward's executive office,

[113] She demands that the house be sold and the money divided between her and ex-husband

where she had still not succeeded in getting paid as the idea of distributing marital property after divorce, let alone selling the house, was unheard of on Songo Songo Island.

Salima opted out of an oppressive marriage as a second wife. Her mother-in-law and sister-in-law subjected her to difficult conditions to the extent that she saw herself as a "house girl"[114] rather than a wife. It was easy for her to seek a divorce from her husband because she did not have any children with him. Her husband and co-wife kept reminding her that she was barren and did not have a right to any property from the household. When she complained to her natal family about the oppression she was suffering from her husband, co-wife and mother-in-law, they did not want to be seen to be supporting her. When she told her mother that she was tired of being oppressed and wanted a divorce, her mother told her to make her own decisions, as she knew what to do. She fought her husband and beat him, which left him no option but to divorce her. Salima wanted a divorce because she knew that she would then have the support of her natal family[115] and would be able to find a husband of her own choosing. She refused to go back to her husband before the end of her *eddah* and turned down two marriage proposals before accepting a third as a second wife. This suggests that Salima saw the possibility of choosing a husband herself; as a divorced woman she had more freedom than when she was a young unmarried girl in her parents' care as she indicates:

> *A marriage proposal for a person who has been married before is different. A man will come and ask you directly if you want to live with him, and you can accept or refuse; you make your own choice. (Salima, seaweed farmer, 2009)*

Remarriage is normal in coastal areas and Salima knew that many people were aware of the conditions of her previous marriage. She received support from her father, who turned her husband away when he came to ask her to return to his household. The option of remaining in an abusive and oppressive marriage was outweighed by her perception that her divorce, caused by the abusive conditions, was not stigmatised, making it and marrying again easy. The option of being able to work outside the home and have her own economic independence contributed to her decision to end her first marriage. Salima started farming

[114] "House girl" is commonly used in Tanzania to describe women servants or maids, most of whom are oppressed by their employers and who sometimes work without proper wages or do not receive wages for months. They are the first to wake in the morning and the last to go to bed at night, and are expected to do all the work of the household.

[115] She wrote a letter to her sister telling her that she was seeking a divorce, and when she went back to her natal family her parents supported her. They did not want to be seen supporting their daughter before her divorce as the society would see them as irresponsible parents.

seaweed after her divorce, and continued to do so in her second marriage. I asked her why she had agreed to be a second wife after her bad experience in her first marriage:

> *I received proposals from a man who has a wife already. I accepted him, as I wanted to be married and have my own place. Also, he did not have any problems with me farming seaweed and earning my own income. (Salima, seaweed farmer, 2009).*

The above narratives illustrate that seaweed farming on Songo Songo Island gives women the means to contest men's authority in marriage and displace them as providers. This threat to the men's masculinity led most of them to feel that "life is better without seaweed" (Khatibu Songo Songo 2009) as women had become their own "owners and controllers" (Jaka, Songo Songo 2009). Other women such as Maimuna decide to remain in their abusive marriage despite having a higher income than their husband's. Maimuna's case indicates that women's economic independence does not deter men from exercising their authority, or women from submitting to it (Cornwall, 2002).

Maimuna husband informed me during a semi-structured interview that his first marriage had broken down because of his wife's infidelity, and as a result his parents had decided that he should marry his cousin. Maimuna endured a lot of hardship in her marriage, including her husband's abusive nature and repeated infidelity. She did not end the marriage, although she lived separately from her husband for almost a year and then returned to her natal home and asked him for a divorce due to his infidelity and abuse,[116] but he refused. Maimuna explained:

> *He did not want my money because he had his own money as he was employed by a seaweed buying company. He would leave the house from the morning until 10 o'clock at night, although he would always leave money for household provisions. In addition, when he came back so late at night he would go out again and come back in the morning. I decided to ask for a divorce as we had lived for almost a year without sleeping together, which is my conjugal right. When I went to my natal home he came to fetch me and my parents told me to go back to him. (Maimuna, seaweed farmer, 2009)*

She did not pursue the matter in the court of law or with BAKWATA; instead she was advised by her parents to return to her husband. For Maimuna the cultural value attached to her identity as a wife was so significant that she decided to return despite her husband's

[116] Maimuna was beaten by her husband because of the income she had from seaweed, octopus and processed fish. She was beaten every time she showed her money to husband. She was also beaten in her pregnancy.

oppressive behaviour. She retained her position of wife because her perceived well-being was weaker in the breakdown position without this identity. The option of breaking out of her marriage was outweighed by perceptions of the social conditioning that oblige women to marry. Maimuna's bargaining position weakened when she opted to have an affair herself as a way out of her marriage, after seeing that she would not get any help from her natal family. However, she still failed to get the divorce she wanted due to social norms about divorce and infidelity:

> *He had his own money and he was having an affair with a married woman. One day I found a bike that I had bought with my seaweed money parked outside the house of a woman with whom I had always suspected him of having an affair. When he came home I asked him about it, and he denied having gone anywhere near where I had said he had been. I said that was fine by me; so I also deliberately went out and openly flirted with men just to hurt him.*
>
> *That made him aware that I can have affairs as well; since that time he has stopped staying out late and we have reconciled, but he still is worried that I might do it again, and that fear keeps us together.* (Maimuna, seaweed farmer, 2009)

The reconciliation was possible because many people in her village knew about her husband's infidelity. This incident and his previous divorce decreased her husband's bargaining position.

Mwanahariri married her first cousin before she even reached puberty. She has three children and several grandchildren. She and her husband moved to Dar es Salaam in 1994 and then returned to Songo Songo in 2000. Mwanahariri is a seaweed farmer and octopus collecter and sells buns and other snacks. Her husband is in the rich category of fishers (see Chapter 4 on livelihoods) and catches sharks and processes their fins. He has his own boat and nets, and fishes with other fishers from Zanzibar.

Mwanahariri explains that the people from Zanzibar who were fishing with her husband caused her marital problems. They brought their wives to Songo Songo and they all stayed in her household for months. She had to clean the house, cook for her husband and his fellow fishers and their wives, fetch water and tend her seaweed farms while the other women did nothing. She blamed her husband for not telling his fellow fishers to ask their wives to assist with the household chores. This resulted in conflict with her husband, who told her to go back to her natal home if she could not cope with the chores. Instead, she

refused to do the housework, including the cooking,[117] and asked for a divorce. Leaving her husband and his fellow fishers without meals prompted their grandfather to call a reconciliation meeting to save the marriage. Mwanahariri used divorce as threat point to raise the issue of the burden of the household chores she was under; however, this did not change the fact that although she was farming seaweed she was still responsible for the reproductive work in her household.

The above cases illustrate how the ability of Songo Songo women to divorce and remarry increases their bargaining power, which, in combination with their ability to earn their own income from seaweed farms outside the household results in a better breakdown position. However, the above narratives suggest that although their income from seaweed farming has generally improved their breakdown position, it has had no impact on the cultural and gender ideologies that influence their intra-household relations.

6.4.2 Women's support group and institutions

Good relations with both natal and marital kin can serve as insurance against divorce. For example, women's practice of secretly siphoning off food and other resources from their husbands to give to their parents and siblings is very common and effectively maintains the support of natal kin in the event of marital failure (see Jackson 2007:113). Adia indicated the importance of kin support, especially from her husband's side, to staying in her marriage:

> *I try my best to have good relations with my in-laws, my husband and all his clan. I do good things for them and engage in their affairs, but at the end of the day if they do not recognise my efforts and start hating me without reason I will not stay in that marriage. I can tolerate his infidelity but I can't tolerate being shunned by his parents and other members of his clan. (Adia, young women's focus group, 2009)*

The same kinship and friendship support can also act as a safety net in the event of divorce, as these relations impinge on intimate relations and in some cases are more significant in determining women's tactics and strategies than their relationship with their husband (Cornwall, 2002).

According to Sen (1987), the point of breakdown at which women decide they simply cannot endure any longer may depend on their fallback position; on support they can call on somewhere else, and on how they can escape the situation. Songo Songo women have

[117] Mwanahariri's sister in-law secretly brought her food which she ate in her room. This forced the other women to cook for their husbands and do other household chores.

support networks as their safety nets and as a source of security outside their conjugal relationships. Apart from kinship ties and friendship they have also established local finance networks which provide them with income to start and run business operations and to buy domestic utensils, clothes and other useful materials.

Two types of informal microcredit network are very common along the coast and on Songo Songo Island; *Mchezo* and *Kikundi*. *Mchezo* is where 10 to 15 women organise themselves and contribute an amount of money averaging 10,000 TZS each on the 30th of every month, which they remit to the head of the group, locally known as *Kijumbe*, who works as collector and accountant. She also has the task of ensuring that each member makes her contribution regularly. Members strive to collect the amount required by various means and send it to the *Kijumbe* at the required time. They agree who is to be the first beneficiary of the scheme by selecting them according to their wishes and needs. Number 1 becomes the first to benefit and the others follow according to the number they have picked or agreed to. At the end of each cycle, one of the women is certain to receive 100,000 TZS if there are 10 members or 150,000 TZS if there are 15 members (the maximum number in most cases), which she would have found difficult to save on her own. The women use this money for various things such as household furniture, construction materials for their houses or their children's school fees.

Kikundi ('company') is another type of local economic network for women on Songo Songo Island in which the women join to support the welfare of each other's families. In this system, up to 30 women contribute 10,000 TZS as a joining fee and when one member is in need of assistance everyone contributes 10,000 shillings, which they give to her. They also contribute various items depending on the need, whether for a funeral or a wedding. A member's contribution of items depends on how close she is to the woman in need. These items range from domestic utensils, clothes and money to food. A woman who asked me to take photographs of her brother's wedding on the island invited me to attend and photograph her receiving items and money from members of her *Kikundi* before the wedding.

Songo Songo women can also join VICOBA, which caters for both men and women and collects weekly contributions. These are microfinance groups voluntarily formed by 30 or more members of the village. The members decide their own rules and regulations and select their leaders and the value of their share and contribution. For instance, in ` group to which Mwajuma belongs the members contribute 4500 TZS as shares and 500 TZS as a contribution to social insurance every Wednesday. This makes a weekly individual contribution of 5,000 TZS (over US$3). Initially Mwajuma took out a short-term loan of

44,000 TZS (US$30); after paying it back, she took out a second loan of 210,000 TZS (US$140) and then a third of 280,000 (US$187). Each loan is repaid to the group with interest.

Mwajuma and other married Songo Songo women‘s direct access to these social and financial networks improves their fallback position. For married women to improve their breakdown position they not only need direct access to women’s groups but also to be able to use their earned income and not have to hand it over to their men.

6.5 Conclusion

In this chapter I have looked at how women’s contributions to their households from their seaweed income have affected gender relations on Songo Songo Island. I have applied Whitehead’s (1981) conjugal contract to describe the meaning of marriage on Songo Songo Island, and Sen’s (1985, 1987, 1990) cooperative model to explore the impact of seaweed farming on women contributions and their breakdown positions. A number of accounts of lived experiences have shown the different ways that marital partners relate to one another, providing narratives of the theories and models in real life

Sen (1990) discusses the relevance of perceived and actual contributions in intra-household bargaining with the view that women’s actual and visible income contributions to the household are key to strengthening their bargaining position. The evidence from Songo Songo indicates that this may not be always the case, as sometimes the higher income that women earn can work to their disadvantage. Maimuna was abused by her husband because of her income; a low income might be to womens’ advantage as it makes men feel more in a control of their household. On the other hand, men’s low perceptions of women income, work to women’s advantage, as they may not be expected to contribute to the household and have the freedom to spend their income on personal needs.

Before seaweed farming became popular, men had a high-income profile from fishing and other activities. With the seaweed farming, women’s status improved to the extent of threatening the men’s position as provider and head of household because of household members’, especially husbands’, dependence on women’s incomes. This has resulted in household conflict over spouses’ roles, control of income and decision-making, affecting their mutual respect and trust. Cultural and religious ideologies emphasise the role of the man as the breadwinner, responsible for taking care of his households’ needs, while woman’s primary responsibility is her reproductive role.

Songo Songo men and women's incomes are temporal in nature; women's contributions to the household are very significant during *Kusi* season when men cannot access the sea due to the strong southerly trade wind, while and the seaweed thrives under such conditions. In the *Kaskazi* season, men's contribution is significant while women's is low as the weather is not favourable for farming seaweed. Seaweed farming has fluctuated as a whole: when it was on the rise, the women's income contributions were considerable to the extent of threatening men's masculinity in the community, while the seaweed's decline, caused by disease, has negatively affected women's autonomy and bargaining position. This situation is referred here as "temporal cooperative conflict". This temporal cooperative conflict, which is caused by fluctuating contributions of income to the households, leads some men to maintain the view that although women's contribution during the *Kusi* season and the rise of seaweed farming was significant, their own status as head of household and breadwinner renders the women's contributions less important.

The study also establishes that there have been no changes in social norms or actual practice on Songo Songo Island, as the sexual division of labour still exists in the household. Even when women spend more time in the intertidal areas farming seaweed and make a higher income contribution to their households, their reproductive roles remained the same and the conjugal contract still applies (Whitehead, 1981).

My findings and analysis in this chapter have indicated that Songo Songo women act according to their perceptions of how their society expects them to behave in marriage regardless of whether or not this contributes to their well-being. In section 6.4. I gave the example of Maimuna, who had a better fallback position but decided to remain in her abusive marriage due to the cultural and gender ideologies that determine gender relations on Songo Songo Island. Also, being married to her cousin, it was not easy for her to get support from her natal family because of fear of breaking kinship ties.

Chapter 7: Summary and Conclusions

7.0 Introduction

This thesis, situated within the broad domain of socio-ecological rural livelihoods, has considered divergent issues and empirical realities that are interrelated and so complex that the enquiry has required methodological and theoretical pluralism. Located within the relationship between humans and nature, it has crosscut the multiple disciplines of cultural anthropology, sociology, political ecology and feminist political ecology. The essence of the research is the acknowledgement that Songo Songo islanders continue to develop experience and resilience as they face numerous livelihood challenges. The men and women who are seaweed farmers, artisanal fishers and octopus collecters are diverse in the contexts of ethnicity, capital and manpower mobilisation, sociocultural power relations and access to marine resources, which is affected by temporal and seasonal variations. Individually and cumulatively, these factors determine a person's position in society.

In order to understand daily realities in Songo Songo and answer my main research question: *How does the rise and decline in seaweed farming affect intra-household gender relations on Songo Songo Island?* In Chapter 4 I addressed the sub-questions: *What are the Songo Songo livelihood options* and *How does seaweed farming affect household income?* Chapter 5 dealt elaborately with research question 2: *How do temporality and other factors affect gendered access to marine resources on Songo Songo Island*? Chapter 6 sought to answer research questions 3: *How does seaweed farmer' income affect gender relations within the household* and 4: *Have women's negotiating and bargaining power changed due to the decline in seaweed farming?*

This chapter unfolds as follows: section 7.1 presents a summary of the findings; section 7.2 shows the contribution of this thesis to the knowledge about coastal livelihoods, gendered access and intra-household gender relations; and section 7.3 details the limitations of the study and offers final remarks.

7.1 Summary of the findings

The findings have been set out in the three chapters that form the three commensurate themes and foci of the thesis, namely: Songo Songo Island livelihoods; gendered access to marine resources, and seaweed farmers' intra-household gender relations. These are summarised below.

7.1.1 Songo Songo Island Livelihoods

In Chapter 4 I explored how the sustainability of rural coastal livelihoods depends on a diversity of marine resources and activities carried out by the people of Songo Songo Island. I focused on the livelihood portfolios of individuals on the island with an emphasis on the division of livelihood tasks between men and women. I found that both cash and subsistence activities are important to the Island community. Whereas individual subsistence activities such as fishing, farming seaweed and collecting octopus do not contribute a large amounts of household cash income, the combined return from these activities significantly contributes to net household subsistence.

I also discussed the gender division in livelihood activities on Songo Songo Island. I explored livelihood activity profiles in terms of gendered roles and relationships at the individual and the household levels. The findings suggest a gendered division of livelihood activities with changes in the nature and availability of specific livelihood activities, including those linked to fishing, farming seaweed and collecting octopus. These changes impact on men and women differently. There is a clear division, not only in productive and reproductive labour but also in livelihood activities in sectors such as fishing, formal employment, gardening, seaweed farming and octopus collecting, with women more involved in the latter two activities. However, women have multiple livelihood activities and move from one to the next, while men link themselves predominantly to one main activity such as fishing, turning to other minor activities for income, such as carpentry, when fishing is not possible due to weather conditions.

Octopus collecting is one of the few important marine resource-based activities in which both men and women on Songo Songo island engage. It was dominated by women before the introduction of seaweed farming on the island in 1998, when women's income from seaweed farming became an important factor shaping intra-household gender relations.

Wage-earning and business opportunities from employment at the gas plant, in construction, security, local government and the retail trade are limited to semi-skilled and unskilled jobs due to the low level of education on Songo Songo. The presence of the gas wells and gas processing industry on the island has opened up a new form of formal employment to the few men on the Islander. Business operations constitute an important aspect of the livelihood strategies on Songo Songo Island. These include the sale of cooked food, fish, clothes, fruit, vegetables, cellphone vouchers and snacks. Both men and women from within and outside the Songo Songo Island engage in this type of small-scale business.

The islanders keep livestock as a form of savings and security, selling them as a last resort when in dire need of money. Men and women's ownership of livestock varies, with men mostly owning cattle while women keep goats and chickens; the former to sell in times of great need and the latter to serve household dietary needs and/or for sale to meet immediate needs. The islanders also use crops such as coconuts as household assets on a small scale, selling them when necessary for money for household use.

Fishing is the main livelihood activity for the majority of the men on the island, with fishing types categorised in terms of the assets they use, namely *Ulimasi* fishers who use a hook and line and no boat; fishing from a dugout canoe using hook and lines; with nets from a dhow; and from a boat with engine. These different categories help to define the fishers' wealth ranking and household status.

Women have diverse social characteristics and marital status. Married women's livelihoods strategies depend on their husbands' status. For instance, the livelihood of a woman married to an *Ulimasi* fisher is different to that of one married to a fisher using a rented boat who can afford to give her capital to set up her own business; or to that of the wife of a fisher who has his own boat. A woman married to a lower-category fisher cannot afford to stay at home and take care of her young children like a the wife of man who is employed with a stable monthly income.

7.1.2 Gendered access to marine resources

The multiple mechanisms by which individuals, groups or institutions gain, control and maintain access to marine resources in particular political and cultural circumstances have been the central focus of this thesis. In Chapter 5 I employed feminist political ecology (Rocheleau, 1995; Rocheleau et al 1996) to systematically trace causal relationships spatially and Ribot and Peluso's (2003) theories of access to look at the other mechanisms of access in the overall analysis. In this context, lunar tidal variations and variations in the weather were found to influence gendered access to marine resources. A key conclusion of this analysis is that local knowledge of temporality and tidal fluctuations determine physical access to marine resources.

I also considers how natural causes such as lunar tidal variations, namely the spring, neap and daily tides and weather-related seasonal variations such as *Kaskazi* and *Kusi*, and the link between these and capital and relational mechanisms determine men and women's physical access to marine resources on Songo Songo Island.

Access to marine resources cannot be understood without reference to existing property rights systems, coastal and marine tenure, the socio-ecological context and existing sociocultural systems. In Chapter 5 I examined formal and informal institutions governing access to and use of marine resources on Songo Songo Island. Holders of property rights assert their sanctioned rights with the associated enforcement mechanisms to control access, as in the case of the government and investors in the natural gas industry in the Songo Songo archipelago, who have zoned off the areas where there are gas wells and the gas pipeline. Structural mechanisms governing access to capital and local knowledge hinder or enable gaining, controlling and maintaining access to marine resources according to islanders' economic and cultural circumstances.

The positions and roles of men and women are culturally and socially constructed and are clearly defined by the gendered nature of the assets they use to access marine resources for their livelihoods. Apart from accessing marine resources differently, men and women's use of assets differ. Women's livelihood activities are limited to farming seaweed, collecting octopus and gleaning for shellfish in the intertidal zone due to cultural norms and customs that prevent them fishing from boats, limiting them going any great distance from home or diving from the reef (Porter et al 2007). While men can fish using hooks and nets, women are not allowed to fish at all.

The intertidal areas around Songo Songo Island are a gendered space and women have to seek their husbands' permission to access them; and even among the women, access to the intertidal areas differs depending on their marital and reproductive status.

7.1.3 Seaweed Farmers' Intra-household Gender Relations

I broadly explored a wide range of issues relating to how women's contributions to their households from the income they gain from seaweed have affected gender relations on Songo Songo Island in chapter 6. I discussed the effects of women's engagement in productive activities on gender relations in their households, drawing on their experiences and daily encounters. I explained the various ways in which spouses relate to one another, applying Whitehead's conjugal contract model (1981) and Sen's cooperative conflict model (Sen 1985, 1987, 1990) to the analysis of Songo Songo island people.

Whitehead's conjugal contract was useful in describing the meaning of marriage on the island, while Sen's cooperative conflict model was used to explore the impact of seaweed farming on women's contributions to the household and on their breakdown position. A number of accounts of lived experiences illustrated the theories and models the different

ways in which marital partners relate to one another in real life. Men articulate their dominance over women using cultural norms and women's acceptance of the situation due to the socialisation that they undergo from a young age.

I employed the cooperative conflict model in the context of contributions to household resources on Songo Songo Island. Female seaweed farmers' contributions were significant when the seaweed farming was at its peak; however, men saw this as a threat to their social status as breadwinners and claimed that the women were being disrespectful. Cultural and religious ideologies emphasise the role of the man as the breadwinner, responsible for taking care of the household's needs, while woman's primary responsibility is to her reproductive role. Songo Songo men and women's incomes are temporal in nature, with the women's contributions to household income significant during *Kusi* season, when men cannot access the sea due to the strong southerly trade wind whereas the seaweed thrives in such weather conditions. Conversely, women's contribution to household income is insignificant during the *Kaskazi* season, which is not favourable for seaweed farming but is good for fishing. I refer to this situation as "temporal cooperative conflict".

Sen (1990) discusses the relevance of perceived and actual contributions in intra-household bargaining, with the view that women's actual and visible contributions of income to the household are key in strengthening their bargaining position. This may not always be the case, however, as earning a high income can work to a women's disadvantage. On the other hand, a man's perception that his wife is earning little income works to the woman's advantage, as he may not expect her to contribute to the household's subsistence and is free to spend her money as she pleases.

Engagement in informal work such as farming seaweed enhances women's bargaining power in ways that significantly change their marital relationship. In order to maintain the autonomy gained from their income and their bargaining position, Songo Songo women give some of their income to their husbands in the form of "loans" which are not repaid, as indicated in the narratives in Chapter 6.

The study found no change to social norms or actual practice on Songo Songo Island, as the gendered division of labour in households and women's reproductive role remain the same as before seaweed farming, even when the women spend time farming seaweed and contribute more income to their households than their husbands. This suggests that Whitehead's (1981) conjugal contract theory holds. Within gender ideology is the gender role expectations spouses have of each other attributing specific roles to each other. Whitehead states that these differences originate from classic stereotype roles for women

and men and once the male breadwinner role is threatened by his wife income, the mode of dealing with the income reinstate him to his socially ascribed role of the head of the household. Therefore the argument that division of labour based on gender is effectively non substitutable and non-comparable shows that Songo Songo women effective access to marine resources is dependent upon power relations between them and their husbands.

Before seaweed farming became popular, men brought in a high income from fishing and diverse other activities while women earned little. Farming seaweed improved women's status to the extent that men felt their position as provider and head of household threatened by the household's dependence, and especially their own dependence, on their wives' income. This has resulted in household conflict over roles and the control of income and decision making, affecting the respect and trust between spouses. Men have strategised ways of gaining access to and controlling women's income in various ways such as borrowing it, taking it by force, stealing it and even begging their wives to give them money after selling their seaweed.

Men's begging and borrowing strategies illustrate ways of managing household conflict over money and income depending on the spouses' fallback positions in relation to asset ownership, the wife's status in society and the presence or absence of domestic violence. When the seaweed farming was flourishing, women's fall-back position was enhanced because they had their own income.

The thesis has focused on the implications of women seaweed farmers' financial contribution for intra-household gender relations. Their participation in the seaweed farming and their subsequent contributions to their households may be linked to their interest in obtaining and maintaining negotiating power. The degree of power they attain depends on several other factors, including cultural norms, gender ideology and social networking, all of which influence perceptions of their contributions. I argue that the implications differ for women according to the type of marriage they are in, including cross-cousin, forced, first and second marriage, as also to the temporal and seasonal variations that cause their, income and contribution to the households to fluctuate. It is difficult to conclude that household gender inequalities are determined by economic power, as some women had no control of the income they earned from the seaweed and others' husbands abused them because of the money they earned and the independence this gave them.

Gender ideology and cultural norms have a strong influence on traditional societies such as that of Songo Songo Island, and women become more regressive due to perception biases.

The Songo Songo women act according to their perceptions of how society expects them to behave in marriage regardless of whether their actions contribute to their well-being.

7.1.4 Overview of Findings

The above analysis has shown changes in livelihood strategies, interests and the practicality of women's income. Before the introduction of seaweed farming, a few women earned a small income from collecting octopus and processing fish, for both of which their access to the sea depended on men. With the introduction of seaweed farming they learned to exploit the intertidal areas, gaining a sense of independence, freedom and autonomy. The money from their seaweed crops enabled them to meet their personal needs independently as well as to help their husbands to meet the household expenses. The thesis has shown that women had the freedom to choose to cover these expenses while their husbands remained the main contributors to the household. The women know the importance of earning and controlling their own income and the bargaining position that this can create for them, and for that reason most still engage in farming seaweed in the hope that the seaweed will recover and enable them to earn well again. Most of the women I interviewed reported that if the seaweed thrived once again they would use their income more strategically, buying their own assets, improving their housing conditions and having their own houses and savings for the future. They have tasted economic independence and autonomy and are keen not to look back.

7.2 Contribution to Knowledge and Future Research

Knowledge is three hand spans: the first breeds arrogance, the second breeds humility and in the third, you realise you know nothing. (Sufyan ath-Thawri)

The above quote describes exactly what I feel about this thesis and the whole process of the research. When I started this study I did not think that I would one day carry out this type of research. As I explained in Chapter 3, this research was prompted by the problems I saw while working on social responsibility for a large energy project in Tanzania. My task, as the person in-charge of the social aspect of the project, was to implement the mitigation measures identified as necessary by social impact assessments. I do not regret my work in the community development programs, which included the construction of the village dispensary and the provision of potable water, electricity and education programmes. However, it did not occur to me that I was alien to Songo Songo livelihoods and the obstacles that the local men and women were encountering in their daily experience. Being

educated, I was a little arrogant: I thought I knew what was happening on the island and that whatever the social impact assessment identified should be mitigated in ways that we deemed fit. However, after working with the people of Songo Songo for almost ten years trying to implement the various programmes mentioned above, humility took over and I started to realise that the men and women were encountering various issues in their daily lives that are not written about in books or reports. This in turn made me realise that I knew nothing.

This realisation took me on my research journey and helped to open my eyes and to the people of Songo Songo's daily realities. It led me to understand that there is more to livelihoods than physical, social and natural capital: livelihoods are about how men and women access natural resources and the impact of this on their households. I concentrated on seaweed farming because it offers a good example of interventions in coastal livelihoods, as seaweed was introduced to Songo Songo Island and other coastal communities in 1998 by Dr. Msuya with the good intention of reducing pressure on marine resources and at the same time economically uplifting the communities engaged in it. Songo Songo women, having few alternative livelihood activities, started farming the seaweed. This led to changes in intra-household gender relations, with men feeling that they were no longer in control. Studying seaweed farming alone, without looking at other livelihood activities such as fishing and octopus collecting, would not have given me a clear picture of daily Songo Songo realities.

The connection between livelihoods, gendered access and intra-household gender relations is very strong, and no matter how I tried to delink one from the other, I failed. I identified Songo Songo men and women's livelihoods based on both marine and land resources in order to understand their income-generating activities. This led me to the question of how the men and women access marine resources for their livelihoods and the impact of the income from their livelihoods on their intra-household gender relations. To access marine resources for their livelihoods, whether farming seaweed or collecting octopus, married women need their husbands' permission. To ensure such permission they concede to their husbands' requests to "borrow" their money, although they know that it will not be repaid. These women are creating and maintaining peace and harmony in their households so that they can continue to access marine resources for their livelihoods. On the other hand, they were also sustaining and maintaining their households when their husbands could not go to sea to fish because of the strong southerly trade wind which can keep them on shore for a week or more. Having more income than men threatened the men's masculinity to the extent that some are now happy that the seaweed has declined However, the decline has created

a vacuum for women with no alternative income, forcing them to shift their farming activity from one place to another looking for places where the seaweed can still thrive. Areas of the coast around the natural gas wells and gas processing plants are out of bounds to villagers for safety reasons, limiting the space available for seaweed farms.

Although oil and gas exploration and the natural gas wells and processing plant in the Songo Songo archipelago are important to the national economy, they have impacted on Songo Songo livelihoods in terms of islanders' access to the resources they need. With ongoing gas and oil exploration in the Songo Songo South and Kiliwani areas, where women have their seaweed farms and glean for molluscs and octopus close to their homes without the need for a vessel to take them to the reefs, there is a threat that this area will be zoned off, denying them access to their livelihoods. This was overlooked in the previous social impact assessment, which considered the provision of social and physical infrastructure. For instance, there is no point in people having potable water and electricity that they must pay for when their access to the marine resources by which they earn their daily income is limited.

This research sets humans in their social and natural setting, and thus direct learning through participatory observation and engagement with the Songo Songo women in their day to day activities such as collecting octopus, farming seaweed and gleaning for molluscs in the intertidal areas was significant. In sharing people's joy, pain, visions, conflicts, struggles and success, participant observation is inclusive and responsive, respectful, problem-solving, visionary and empowering. The photographs that I and sometimes the villagers themselves took, and the semi-structured, structured and unstructured interviews that I carried out, offered immense potential to think beyond the classic ambivalence rather than calculating numbers generated through quantitative methods. Quantitative tools mostly adhere to quantifiable aspects such as frequency, quantity and amount for ease of modeling and digital expression, while qualitative tools are more significant to learning about the 'how, why, what, where and when of things' (Mason, 2002). My field notes and pilot study data proved very useful in generating original ideas.

This thesis contributes to the growing body of literature interested in marine resource access and utilisation in relation to gender and power relations at different levels. Rather than focusing exclusively on the community as user group, my analysis addresses issues at the household level and explores interactions between household members and issues of access for the Songo Songo people as a community and other marine resource users such as the government and their investors. This research is unique, especially in the context of

the Songo Songo archipelago, which is rich in marine resources, and of Songo Songo island in particular, in terms of covering the views of local people who have been excluded from their traditional user rights by oil and natural gas exploration in the area. It shows that access to marine resources is determined not only by the mechanisms identified by Ribot and Peluso's (2003) theory of access but also by natural phenomena over which human beings have no control, such as the lunar and daily tidal variations and the trade winds which determine access to marine resources on the island.

Some of the findings of this thesis may be applicable and transferable to other contexts where mariculture such as seaweed farming and other interventions seek to help coastal people with the sustainable utilisation and management of their marine resources. They are particularly relevant to Tanzania, including Zanzibar and other countries in the East Africa Marine Eco-region (EAME) such as Kenya and Mozambique, where there are challenges of globalisation on utilisation of marine resources; and where programs and policies seek to engage the support of the local population through the enhancement of their livelihoods and sustainable marine resource management. I have shown that introducing livelihoods projects such as seaweed farming as a way of reducing pressure on marine resources and supporting the livelihoods of the poor is a complex conservation and poverty eradication challenge, as it is entangled in the web of cooperative conflict and gender relations in the household as well as globalisation and political ecology in terms of the external markets for marine resources and the utilisation and exploration of oil and gas in the region.

Future Research

In this research I have provided detailed information on Songo Songo Island livelihoods, gendered access to marine resources and intra-household gender relations, with an emphasis on seaweed farming. Future research might concentrate on the impact of oil and gas exploration on the livelihood dynamics in Songo Songo archipelago and the gendered impact of collecting octopus there.

7.3 Final remarks

This research is about men and women's livelihoods, their access to marine resources and their intrahousehold relations. Hence, rather than looking to scientists to learn about systems and marine resource dynamics, I relied heavily on day-to-day experiences to learn about these subjects.

It offers a step forward in the study of livelihoods, access and intra-household gender relations. The research presented me with many moments of personal learning about Songo

Songo livelihoods and the persistent poverty of some of the families I interviewed; the women's perseverance after the decline of the seaweed and thus the income on which they had depended so much to feed their hungry children. This learning and my reflections as an observer and participant in the field, especially on the day I accompanied three women on an octopus-collecting expedition from which we returned almost five hours later having caught nothing of significance, continue to haunt my memory.

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Appendices

Appendix 1: Stakeholders in seaweed farming in this research

S/N	***Stakeholder***	***Importance***
1	Tanzania state (central government)	Ministry responsible for fishery management, as seaweed falls under fishery department; Corporation responsible for oil and gas under the central government
2	Kilwa District Authority (local government)	District Executive Director's office responsible for all activities in the district including fishery Department responsible for gender & development in Tanzania. Provided secondary data for my research
3	Songo Songo Ward executive office	Responsible for development planning and implementation at ward level: the source of primary and secondary ward-level data
4	Songo Songo Village government	Implementation of development activities and livelihoods at village level. This was a source of primary and secondary data at a village level
5	Seaweed buying businesses	Organize seaweed farming, provide farmers with the necessary and buy their seaweed for export to the global market. Source of primary and secondary data
6	Environmental NGOs (e.g. WWF)	Implementation of conservation activities and innovations in coastal areas; source of secondary data.
7	Academic institutions (e.g Marine Institute, University of Dar es Salaam)	Research and projects in coastal areas in collaboration with other institutes. Introduced seaweed farming to coastal areas and continue to research the subject.
8	Seaweed farmers	Participants in my research. Their experience in seaweed farming and gender relations questions answered my research questions.
9	Non-seaweed farmers	People not farming seaweed, but who may have done and then abandoned the activity for various reasons.

Appendix 2 Household survey

Control information

Task	Date(s)	By who?	Status OK? If not, give comments
Interview			
Checking questionnaire			
Coding questionnaire			
Entering data			
Checking & approving data entry			

A. Identification

1. Identification and location of household

1. Household name and code	**(name)*	(HID)
2. Name and PID (see B. below) of primary respondent	**(name)*	*(PID)*
3. Name and PID (see B. below) of secondary respondent	**(name)*	*(PID)*
4. Distance of household from the centre of the village (in *minutes of walking* and in *km*)	*1.* *min*	*2.* *km*

B. Household composition

1. Who are the members of the household?

1. Personal Identification Number (PID)	*** Name of household member**	**2. Relationship to household head[1]**	**3. Year born[2)]** *(yyyy)*	**4. Sex** *(0=male 1=female)*	**5. Education** *(number of years completed)*
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					

1) Codes: 0 = Household head;*1 = spouse (legally married or cohabiting); 2 = son/daughter; 3 = son/daughter in law; 4 = grandchild; 5 = mother/father; 6 = mother/father-in-law; 7 = brother or sister; 8 = brother/sister-in-law; 9 = uncle/aunt; 10 = nephew/niece; 11 = step/foster child; 12 = other family; 13 = not related (e.g. servant).*

2) One may ask about age, and then calculate 'year born' when entering data

2. Marital status and other information regarding the head of this household.

1. What is the marital status of the household head? *Codes: 1 = married and living together; 2 = married but spouse working away; 3 = widow/widower; 4 = divorced; 5 = never married; 9 = other (specify):*	
2. How long ago was this household formed?	*years*
3. Was the household head born in this village? *If 'yes', go to 5. Codes: 1= Yes; 0= No*	
4. If 'no'**:** how long has the household head lived in the village?	*years*
5. Does the household head belong to the largest ethnic group/caste in the village? *Codes: 1= Yes; 0= No*	*.*

C. Land Ownership

1. Please indicate the amount of land (in hectares) that you currently own and/or rent in/out.

Category	**1. Area** *(ha)*	**2. Ownership** *(code: tenure)*	**Main products grown/harvested in the past 12 months**		
			Rank 1	**Rank 2**	**Rank 3**
Agricultural land:					
1. Cropland					
2. Pasture (natural or planted)					
3. Gardens					
4. Fallow					
5. Residential					
Marine areas					
1. Fishing					
2. Octopus collecting					
3. Seaweed farming areas					
4. Recreation/tourism					
6. Total land owned (1+2+3+…+9)					
7. Land rented out (**included** in 1-9)					
8. Land rented in (**not included** in 1-9)					

Codes: 1 = State 2 = Community 3 = Private 4 = Open access

D. Seasons and livelihoods

Seasons	**Activities**		
1. Kusi			
2. Kaskazi			
3. Matlai			
4. Others			

E. Access to resources

1. How far is it from the house/homestead to the edge of the nearest area that you have access to and can use for your livelihood activities?	1. … measured in terms of distance (straight line)?	*km*
	2. … measured in minutes walking)?	*min*
2. Does your household collect firewood? *If 'no', go to 8. (Codes: 1=Yes; 0 = no)*		
3. **If 'yes'**: When do you collect firewood?		*(time)*
4. Who collects firewood in your household?		
5. Where does the household get water from?		
6. Who fetches the water in this household?		
7. How has the availability of marine products for livelihoods changed over the past five years? *Codes: 1 = declined; 2 = about the same; 3 = increased* *If code '2' or' 3', go to 7.*		

8. **If declined** (code '1' in the question above), how has the household responded to this decline in the availability of marine products for its livelihood activities? *Please rank the most important responses, max 3.*	**Response**	**Rank 1-3**
	1.	
	2.	
	3.	
	4.	
	5.	
	6.	
	7.	
	8.	
	9.	
	10	
	11.	
	12.	
	13.	
	14.	

9. Has your household farmed seaweed in the past five years? *If 'no', go to next section. (Codes: 1=Yes; 0 = no)*			
10. **If yes:** How many plots do you have?	**Number of plots**	**Number of ropes**	**Ownership**

F. Direct income (income from unprocessed marine products)

1. What are the quantities and values of the marine products the members of your household have collected for both own use and sale over the past month?

1. Marine products	2. Collected by whom?	Collected where?		5. Quantity collected	6. Own use (incl. gifts)	7. Sold (incl. barter)	8. Price per unit	10. Type of market	11. Gross value	11. Transport/ market-ing costs (total)	12. Net income
		3. Land type (code: land)	4. Owner-ship (code: tenure)								

1) Codes: 1 = only/mainly by wife and adult female household members; 2 = adult males and adult females participate about equally; 3 = only/mainly the husband and adult male household members; 4 = only/mainly girls (<15 years); 5 = only/mainly boys (<15 years); 6 = only/mainly children (<15 years), boys and girls participate about equally; 7 = all members of household participate equally; 8 = none of the above.

G. Non-natural resource income

1. Type of product	Collected where?		4. Quantity collected	5. Unit	6. Own use (incl. gifts)	7. Sold (incl. barter)	8. Price per unit	9. Gross value (4*8)	10. Costs (inputs, hired labour, market-ing, etc.)	11. Net income (9-10)
	2. Land type (code: land)	3. Owner-ship (code: tenure)								

H. Waged income

1. Has any member of the household had paid work over the past month?
Note: One person can be listed more than once for different jobs.

1. Household member (PID)	2. Type of work (code: work)	3. Days worked past month	4. Daily wage rate	5. Total wage income (3*4)

I. Income from own business (not including marine products or non-natural resource products)

1. Are you involved in any type of business, and if so, what are the gross income and costs related to that business over the past month?
Note: If the household is involved in several different types of business, fill in one column for each business.

	Business 1	Business 2	Business 3
What is your type of business?[1]			
Gross income (sales)			
Costs:			
Purchased inputs			
Own non-labour inputs (equivalent market value)			
Hired labour			
Transport and marketing cost			
Capital costs (repair, maintenance, etc.)			
Other costs			
Net income			
Current value of capital stock			

[1] Codes: 1 = shop/trade; 2 = agric. processing; 3 = handicraft; 4 = carpentry; 5 = other marine based; 6 = other skilled labour; 7 = transport (car, boat, etc); 8 = lodgings/restaurant; 9 = brewing; 10 = brickmaking; 11 = landlord/real estate;
12 = herbalist/traditional, healer/witch doctor; 13 = quarrying; 19 = other (specify):

J. Other income sources

1. Please list any other income that the household has received during the past 3 months.

1. Type of income	2. Total amount received in the past 3 months
Remittances	
Support from government, NGO, organisation or similar	
Gifts/support from friends and relatives	
Pension	
Payment for renting out land (if in kind, state the equivalent in cash)	
Other, specify:	

K. Assets and savings

1. Please indicate the type of house you have:

1. Do you have your own house? [1]	
2. What is the type of material of (most of) the walls? [2]	
3. What is the type of material of (most of) the roof ?[3]	
4. How many m^2 approx. is the house?	m^2

1) Codes: 0 = no; 1 = own the house on their own; 2 = own the house together with other household(s); 3 = rent the house alone; 4 = rent the house with other household(s); 9 = other, specify:
2) Codes: 1 = earth; 2 = wood (boards, trunks); 3 = metal sheeting; 4 = bricks or concrete; 5 = reeds/straw/grass/fibers; 9 = other, specify:
3) Codes: 1 = thatch; 2 = wooden boards; 3 = metal sheets; 4 = tiles; 9 = other, specify:

2. Please indicate the number and value of assets and other large household items that are owned by the household.

Assets	**1 yes, 2 no.**
1. Fishing boat	
2. Boat engine	
3. Bicycle	
4. Motorcycle	
5. Furniture	
6. Cellphone	
7. TV	
8. Radio	
9. Cassette/CD/ VHS/VCD/DVD/ player	
10. Stove for cooking (gas or electric only)	
11. Refrigerator/freezer	
12. Car/truck	
13. Chainsaw	
14. Wooden cart or wheelbarrow	
15. Tractor	
16. Water pump	
17. Solar panel	
18. Other (specify)	
99. Not applicable	

3. Please indicate the household savings and debt.

1. How much does the household have in savings in banks, credit associations or VICOBA?	
2. How much does the household have in savings as livestock?	
3. How much does the household have in savings as non-productive assets such as gold and jewellery?	
4. How much does the household have in outstanding debt?	

L. Stress, shocks and coping strategies

1.Has the household faced any major income shortfalls or unexpectedly large expenditures during the past 12 months?

Event	How did you cope with the income loss or costs? Rank (max. 32)		
	Rank 1	Rank 2	Rank 3

M. Welfare perceptions and social capital

All things considered, how satisfied are you with your life over the past 12 months? Codes: 1 = very unsatisfied; 2 = unsatisfied; 3 = neither unsatisfied or satisfied; 4 = satisfied; 5 = very satisfied		
Have the household's earnings from livelihoods over the past 12 months been sufficient to cover what you consider to be the needs of the household? Codes: 1 = no; 2 = reasonable (just about sufficient); 3 = yes		
Compared with other households in the village (or community), how well-off is your household? Codes: 1 = worse-off; 2 = about average; 3 = better-off		
How well-off is your household today compared to 5 years ago? Codes: 1 = less well-off now; 2 = about the same; 3 = better off now If 1 or 3, go to 5. If 2, go to 6.		
If worse- or better-off, what is the main reason for the change? Please rank the most important responses, max 3.	Reason: Change in …	Rank 1-3
	19. other (specify):	
Do you consider your village (community) a good place to live? Codes: 1 = no; 2 = partly; 3 = yes		
Do you generally trust people in the village (community)? Codes: 1 = no; 2 = partly, trust some and not others; 3 = yes		
Can you get help from people in the village (community) if you are in need, for example if you need extra money because someone in your family is sick? Codes: 1 = no; 2 = sometimes but not always; 3 = yes		

F. Enumerator/researcher assessment of the household

Note: This is to be completed by the enumerator

During the last interview, did the respondent smile or laugh? Codes: (1) neither laughed nor smiled (sombre); (2) only smiled; (3) smiled and laughed; (4) laughed openly and frequently.	
Based on your impression and what you have seen (house, assets, etc.), how well-off do you consider this household to be, compared to other households in the village? Codes: 1 = worse off; 2 = about average; 3 = better off	
How reliable is the information generally provided by this household? Codes: 1 = poor; 2 = reasonably reliable; 3 = very reliable	
If the information is not reliable (code 1 above), do you think the information over- or underestimated the actual livelihood issues? Codes: 1 = underestimated; 2 = overestimated; 3 = no systematic over- or underestimation; 4 = don't know.	

Appendix 3 Village Survey: Village government

Control information

Task	Date(s)	Enumerator	Time frame & Status
Meeting with officials			

A. Demographics

1. In what year was the village established?	
2. What is the current population of the village?	*persons*
3. How many households are there currently in the village?	*households*
4. What was the total population of the village 10 years ago?	*persons*
5. How many households were there in the village 10 years ago?	*households*
6. How many persons (approx.) living here now have moved to the village within the past 10 years (immigration)?	*persons*
7. How many persons (approx.) have left the village over the past 10 years (emigration)?	*persons*
8. How many different groups (ethnic, tribes, religious) live in the village?	

B. Infrastructure

9. How many households (approx.) in the village have access to electricity (from public or private suppliers)?				*households*
10. How many households (approx.) in the village have access to (= use) piped tap water?				*households*
11. How many households (approx.) have access to formal credit (government or private bank operating in the village)?				*households*
12. Are informal credit institutions such as savings clubs and money lenders present in the village?				*(1-0)*
13. Is there a health centre in the village?				*(1-0)*
14. Does the village have at least one road useable by cars all year round?				*(1-0)*
15. What is the distance to the nearest water source that is available all year round?				*km*
16. What is the distance from the village centre to the nearest … (in km and in minutes by most common means of transport)	17. village market	**1. km**	**2. min**	***3. transport***
	18. district market			
	19. market for major consumption of goods			
	20. market where marine products are sold			
	21. market where seaweed is sold			

C. Sea and land cover/use

1. Land categories in the village (approx. area in hectares).

1. Land category *(code: land)*	**Ownership**			
	3. State	**4. Community**	**5. Private**	**6. Open access**
1. Ocean				
2. Pasture (natural or planted)				
3. Seaweed farming plots				
4. Fishing grounds				
5. Infrastructure				
6. Shrubs				
7. Residential areas				
8. Ritual areas (*Kwenye matambiko*)				
9. Gas plant & gas wells				
10. Caverns (water source)				
11. Other, specify:				
12. Total land area				

D. Natural resource base

Note: The questions should be asked in a village meeting or focus group for each of the categories in turn (i.e. column by column, and not row by row).

1. What is the most important product (MIP) for the livelihood of the people in the village)? [2] *(name)*		**1.**	**2.**	**3.**	**4.**	**5.**	**6.**
3. How has availability of the MIP changed over the past 5 years? *Codes: 1 = declined; 2 = about the same; 3 = increased*							
4. If the availability of the MIP in this category has **declined**, what are the reasons? *Please rank the most important reasons*	**Reason**	**Rank 1-3**	**Rank 1-3**	**Rank 1-3**	**Rank 1-3**	**Rank 1-3**	**Rank 1-3**
	1.						
	2.						
	3.						
	4.						
	5.						
	6.						
	7.						
	8.						
	9. Other (specify):						
5. If the availability of the MIP in this category has **increased**, what are the reasons? *Please rank the most important reasons,*	**Reason**	**1-3**	**1-3**	**1-3**	**1-3**	**1-3**	**1-3**
	1.						
	2.						
	3.						
	4.						
	5.						
	6.						
	9. Other, specify:						

1) Select the most important product for the village that does not fall into any of the other five categories.

2) 'Most important' is defined as most important for the wellbeing of the village, whether through direct use in the home, sale for cash, or both.

E. Risk

1. Has the village faced any of the following crises over the past 12 months? *Codes: 1=yes; 0=no,*	1. Flood and/or excess rain	
	2. Drought	
	3. Widespread crop pest/disease/animal disease	
	4. Human epidemics (disease)	
	5. Political/civil unrest	
	6. Migration	
	7. Other (specify):	

F. Wages and prices

1. What was the typical daily wage rate for work for adult **male/female** labour during the **peak/slack** season in this village over the past 12 months?		**Male**	**Female**
	Peak	1.	2.
	Slack	3.	4.
2. What is the main staple food in the village?			

Appendix 4 Guidelines for semi-structured interviews

1. Identification of the interviewee
2. Historical context of seaweed farming (plots, shifting cultivation, access to farming sites, rise and decline)
3. Seaweed farming and seasonality (*kaskazi/kusi: maji mafu/maji makuu)*
4. Livelihoods (Who does what? Who earns what? Support from spouse or member of household?)
5. Marital status (marriage: type of, number of, number of partners, cultural and religious norms regarding marriage); Divorce: number of, reasons for, who initiated,)
6. Children (school attendance, gender division of labour (the kinds of tasks boys and girls do), support from children)
7. Explain daily phenomena (low tide/high tide)
8. Explain monthly experiences (Spring tide/neap tide)
9. Intrahousehold relations (responsibilities and gender division of labour, managing household income/money, accessing household income, making decisions); intrahousehold relations during the rise of the seaweed and now with the seaweed in decline.

Appendix 5 Focus Group Discussion Guidance

- Background information on study area
- Livelihoods
- Effects of seasons on livelihoods
- Resource accessibility and availability
- Rules governing resource use and land ownership
    a. Seaweed farming area
    b. fishing area
    c. farming (coconuts)
    d. octopus collecting
    e. open space
    f. residential
    g. bushes (firewood collection)
- Rise and decline in seaweed farming and its effect on intrahousehold relations
- Gender intra-household relations (decision making, roles and responsibilities.

Appendix 6 Songo Songo Tide Table for June 2009

TIDE, JUNE, SONGO SONGO ISLAND

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

Latitude 08° 31′S **Longitude 039° 30′E**

TIME ZONE -0300 **YEAR 2009**

Date	Time	m	Time	m	Time	m	Time	m
Mo 01	0506	1.22	1121	2.75	1750	1.42	2347	2.76
Tu 02	0630	1.26	1234	2.82	1920	1.32		
We 03	0102	2.76	0741	1.23	1336	2.94	2026	1.17
Th 04	0205	2.80	0835	1.19	1429	3.08	2119	1.03
Fr 05	0259	2.84	0918	1.16	1514	3.20	2201	0.92
Sa 06	0345	2.85	0952	1.15	1555	3.28	2238	0.87
Su 07	0427	2.83	1020	1.16	1632	3.33	2309	0.86
Mo 08	0503	2.77	1045	1.17	1705	3.33	2337	0.87
Tu 09	0536	2.71	1109	1.18	1735	3.30		
We 10	0003	0.91	0605	2.64	1135	1.18	1803	3.25
Th 11	0030	0.95	0632	2.60	1205	1.20	1829	3.18
Fr 12	0058	1.01	0658	2.58	1238	1.23	1858	3.08
Sa 13	0130	1.06	0729	2.58	1317	1.29	1931	2.96
Su 14	0205	1.13	0808	2.59	1404	1.37	2013	2.82
Mo 15	0246	1.20	0859	2.61	1503	1.45	2107	2.65
Tu 16	0337	1.28	1005	2.65	1620	1.51	2220	2.52
We 17	0441	1.33	1119	2.73	1753	1.47	2345	2.46
Th 18	0556	1.33	1232	2.89	1919	1.31		
Fr 19	0103	2.52	0712	1.26	1334	3.10	2027	1.08
Sa 20	0209	2.66	0817	1.14	1429	3.32	2121	0.85
Su 21	0304	2.83	0913	0.99	1520	3.51	2209	0.64
Mo 22	0354	3.01	1003	0.86	1607	3.67	2253	0.50
Tu 23	0441	3.15	1049	0.76	1653	3.76	2335	0.41
We 24	0526	3.25	1133	0.72	1738	3.78		
Th 25	0015	0.41	0611	3.29	1215	0.73	1823	3.72
Fr 26	0056	0.47	0657	3.26	1258	0.80	1910	3.58
Sa 27	0137	0.61	0743	3.18	1342	0.92	1958	3.38
Su 28	0219	0.79	0833	3.05	1430	1.09	2050	3.13
Mo 29	0305	1.00	0929	2.91	1525	1.27	2149	2.87
Tu 30	0357	1.22	1032	2.79	1638	1.43	2259	2.64

Source: Tanzania Ports Authority 2009

Appendix 7 Profile of Respondents

Household Identity	Household Characteristics
A01	**Household structure:** Spouses living with their 3 children **Ages**: Husband 35, wife 26; children 13, 10, 4 **Marital status:** Married **Education level:** Adults; primary education (Standard 7); children in primary school **Years living in this household**: 13 **Livelihoods:** Fishing, small business selling charcoal, coconuts, salt and snacks.
A02	**Household structure:** Spouses living with their niece and her children **Ages**: Husband 54, wife 45; niece 28, children 4, 1 **Marital status:** Married **Education level:** Husband completed Standard 8; wife finished Standard 4, niece completed Standard 7 **Years living in this household**: 38 **Livelihoods:** Fishing with nets in own vessel, shark fin business, seaweed farming, gardening; coconuts, keeping goats and chickens, small scale business selling juice.
A03	**Household structure:** Widow living with her 2 orphaned grandchildren **Ages**: Woman 5, grandchildren 15, 10 **Marital status:** Widow **Education level:** Only attended Madrasa (Quranic school); children in primary school **Years living in this household**: 9 **Livelihoods:** Seaweed farming, octopus collecting; gardening
A04	**Household structure:** Young man living alone **Age** 23 **Marital status:** Single **Education level:** Adults; primary education (Standard 7) **Years living in this household**: 5 **Livelihoods:** Fishing with hooks and lines in a vessel; carpentry and barber shop when not fishing
A05	**Household structure:** Spouses living with their 2 children and nieces and nephews **Ages**: Husband 31, wife 25; children 15, 13, nieces 11, 9, nephew 8 **Marital status:** Married **Education level:** Adults; primary education (Standard 7) children in primary school **Years living in this household**: 6 **Livelihoods:** Fishing from a boat, small business selling charcoal, coconuts, salt and snacks, keeping livestock (cow, goats)
A06	**Household structure:** Spouses living with their 5 children **Ages**: Husband 45, wife 30; children 20, 15, 13, 12, 10, **Marital status:** Married **Education level:** Adults; primary education (Standard 7) young children in primary school

	Years living in this household: 18 **Livelihoods:** Fishing, keeping livestock (goats)
A07	**Household structure:** Spouses living with their child **Ages**: Husband 27, wife 22; child 1 **Marital status:** Married **Education level:** Adults; primary education (Standard 7) **Years living in this household**: 2 **Livelihoods:** Masonry, collecting cowries/shells.
A08	**Household structure:** Spouses living with their child **Ages**: Husband 41, wife 40, child 2 **Marital status:** Married **Education level:** Adults; primary education (Standard 7) **Years living in this household**: 5 **Livelihoods:** Fishing, octopus collecting, gardening and selling soft drinks.
A09	**Household structure:** Widow living with 2 grandchildren **Ages**: Woman 60, grandchildren 1, 4 **Marital status:** Widow **Education level:** Attended Madrasa (Quranic school) **Years living in this household**: 40 **Livelihoods:** Seaweed farming, octopus collecting, gardening, keeping goats.
A10	**Household structure:** Spouses living with their 4 children **Ages**: Husband 40, wife 36, children 20, 15, 12, 9 months **Marital status:** Married **Education level:** Adults; primary education (Standard 7) children in primary school **Years living in this household**: 23 **Livelihoods:** Fishing, small business selling charcoal, coconuts, salts, and snacks.
A11	**Household structure:** Sharing house with a friend, wife lives on the mainland **Ages**: Man 30, male friend 25 **Marital status:** Married **Education level:** Adults; primary education (Standard 7) **Years living in this household**: 6 **Livelihoods:** Fishing in a group of 15 people.
A12	**Household structure:** Spouses living with their niece and child **Ages**: Husband 41, wife 27; child 12, niece 2 **Marital status:** Married **Education level:** Adults; primary education (Standard 7) children in primary school **Years living in this household**: 10 **Livelihoods:** Husband work as security guard at the camp, wife weaves palm leaves.
B01	**Household structure:** Single woman living with her children **Ages**: Woman 38; children 18, 8, 4 **Marital status:** Single

	Education level: Adults; primary education (Standard 7), children in primary school **Years living in this household**: 5 **Livelihoods:** Seaweed farming, gardening at Kiliwani, got 3 chickens
B02	**Household structure:** Spouses living with a mother in law and their children **Ages**: Husband 50, wife 45, mother in law 60+, children 15, 3 **Marital status:** Married **Education level:** Husband completed Standard 4, wife completed Standard 7, child in primary school **Years living in this household**: 16 **Livelihoods:** Fishing, octopus collecting, seaweed farming.
B03	**Household structure:** Spouses living with their niece and child **Ages**: Husband 65, wife 50, child 12, niece 2 **Marital status:** Married **Education level:** Adults; primary education (Standard 7) children in primary school **Years living in this household**: 40 **Livelihoods:** Fishing, octopus collecting, gardening, keeping chickens.
B04	**Household structure:** Spouses living with their child and grandchild **Ages**: Husband 65, wife 50, child 14, grandchild10 **Marital status:** Married **Education level:** Adults; primary education (Standards 4 and 7), children in primary school **Years living in this household**: 40 **Livelihoods:** Seaweed farming, octopus collecting, gardening, keeping cattle
B05	**Household structure:** Spouses living with their niece and their children **Ages**: Husband 43, wife 35, children 15, 9, 7, niece 5 **Marital status:** Married **Education level:** Adults; primary education (Standard 7), children in primary school **Years living in this household**: 13 **Livelihoods:** Fishing, octopus collecting, seaweed farming, keeping 1 cow and 2 goats.
B06	**Household structure:** Spouses living with their child **Ages**: Husband 37, wife 28, child 12 **Marital status:** Married **Education level:** Adults; primary education (Standard 7), child in primary school **Years living in this household**: 12 **Livelihoods:** Fishing, octopus collecting, seaweed farming.
B07	**Household structure:** Spouses living with their niece and her child and their own children **Ages**: Husband 34, wife 27, niece18, children 16, 14, 12 and 6 months baby of their niece **Marital status:** Married **Education level:** Adults; primary education (Standard 7), children in

	primary school **Years living in this household**: 18 **Livelihoods:** Seaweed farming, octopus collecting.
B08	**Household structure:** Spouses living with their child **Ages**: Husband 48, wife 26, children 5 **Marital status:** Married **Education level:** Adults; primary education (Standard 7) children in pre- school **Years living in this household**: 7 **Livelihoods:** Fishing and seaweed farming.
B09	**Household structure:** Woman living with her siblings; her husband working on mainland **Ages**: Woman 36, siblings 16, 12, **Marital status:** Married **Education level:** Adults; primary education (Standard 7), children in primary school **Years living in this household**: 22 **Livelihoods:** Octopus collecting, seaweed farming
B10	**Household structure:** Spouses living with their children **Ages**: Husband 41, wife 32, children 12, 6, 2 **Marital status:** Married **Education level:** Adults; primary education (Standard 7), children in primary school **Years living in this household**: 16 **Livelihoods:** Fishing, octopus collecting, seaweed farming, gardening, keeping chickens
B11	**Household structure:** Spouses living with their child **Ages**: Husband 50, wife 30, child 12 **Marital status:** Married **Education level:** Adults; primary education (Standard 7), child in primary school **Years living in this household**: 11 **Livelihoods:** Fishing, seaweed farming
B12	**Household structure:** Divorced woman living with her children and her niece **Ages**: Woman 54, niece 25, children 12, 2 **Marital status:** Divorced **Education level:** Adults; primary education (Standard 7), children in primary and secondary school **Years living in this household**: 8 **Livelihoods:** Octopus collecting, seaweed farming, collecting shells
B13	**Household structure:** Widower living with her children **Ages**: Widower 52; children 28, 15 **Marital status:** Widow **Education level:** Head of household did not attended school, other adult is a school dropout (Standard 3). Younger child in primary school **Years living in this household**: 10 **Livelihoods:** Octopus collecting, seaweed farming, selling coconuts,

	weaving palm leaves.
B14	**Household structure:** Spouses living with their children **Ages**: Husband 52, wife 47, children 25, 15, 7 **Marital status:** Married **Education level:** Adults; primary education (Standard 4 & 7), children in primary school **Years living in this household**: 20 **Livelihoods:** Fishing, seaweed farming, octopus collecting, keeping cattle
B15	**Household structure:** Spouses living with their children and a mother of a his wife **Ages**: Husband 57, wife 35, mother-in law-78; children 27, 12, 2 **Marital status:** Married **Education level:** Only one adult with primary education (Standard 7) **Years living in this household**: 5 **Livelihoods:** Tailoring, seaweed farming; selling coconuts
B16	**Household structure:** Spouses living with their children **Ages**: Husband 32 wife 32, children 6, 2, 1 **Marital status:** Married **Education level:** One person with incomplete primary education (Standard 5) **Years living in this household**: 7 **Livelihoods:** Seaweed farming, husband transport octopus to the mainland
B17	**Household structure:** Spouses living with their children and grandchild **Ages**: Husband 40, wife 25, children 19, 13, 16, 8, and grandchild 8 months **Marital status:** Married **Education level:** Adults; primary education (Standard 7), children in primary school **Years living in this household**: 29 **Livelihoods:** Security guard, seaweed farming, octopus collecting and keeping goats
B18	**Household structure:** Spouses living alone **Ages**: Husband 60+, wife 50 **Marital status:** Married **Education level:** Standard 1 and 4 **Years living in this household**: 42 **Livelihoods:** Fishing from a vessel and seaweed farming.
B19	**Household structure:** Spouses living with their children **Ages**: Husband 50+, wife 40, children 20, 9 **Marital status:** Married **Education level:** Adults: Standard 4 and 7, children in secondary and primary schools **Years living in this household**: 25 **Livelihoods:** Carpentry and seaweed farming.
B20	**Household structure:** Spouses living with their children

	Ages: Husband 45, wife 40, children 19, 16, 12, 4, 2 **Marital status:** Married **Education level:** Adults: primary education (Standard 7), children in secondary and primary schools **Years living in this household**: 23 **Livelihoods:** Repairing vessels, farming seaweed, selling snacks, keeping cattle
B21	**Household structure:** Spouses living with their child **Ages**: Husband 50+, wife 40, child 15 **Marital status:** Married **Education level:** Adults; primary education (Standard 7) child in primary school **Years living in this household**: 20 **Livelihoods:** Fishing, seaweed farming, octopus collecting
B22	**Household structure:** Woman living with her children, her mother and her daughter-in-law **Ages**: Woman 49, Mother 60+; daughter-in-law 20 children, 24, 18, 15 **Marital status:** Divorced **Education level:** Adults; primary education (Standard 7), children in primary school **Years living in this household**: 16 **Livelihoods:** Seaweed farming, selling snacks and keeping cattle.
B23	**Household structure:** Spouses living with their children **Ages**: Husband 40, wife 35, children 13, 7, 5, 2 **Marital status:** Married **Education level:** Adults; primary education (Standard 7), children in primary school **Years living in this household**: 21 **Livelihoods:** Seaweed farming, selling coconuts and snacks, and gardening.
B24	**Household structure:** Divorced woman living with her children **Ages**: Woman 37, children 21, 20, 16, 13 **Marital status:** Married **Education level:** Adult: primary education (Standard 7), children in primary school **Years living in this household**: 2 **Livelihoods:** Seaweed farming, octopus collecting and gardening
B25	**Household structure:** Widow living with her children and grandchildren **Ages**: Woman 50, children 25, 20, grandchildren 8, 1 **Marital status:** Widow **Education level:** Widow did not attend school. Two children completed primary education (Standard 7), one child in primary school **Years living in this household**: 10 **Livelihoods:** seaweed farming, gardening,
B26	**Household structure:** Spouses living with their children **Ages**: Husband 37, wife 33, children 18, 9 **Marital status:** Married **Education level:** Adult primary education (Standard 7), children in secondary school **Years living in this household**: 19

	Livelihoods: Fishing, seaweed farming, octopus collecting, gardening, keeping cattle
B27	**Household structure:** Widow living with her children **Ages**: Woman 45; children 16, 10, 9, 7, 6 **Marital status:** Married **Education level:** Adult Standard 4 children in secondary and primary schools **Years living in this household**: 30 **Livelihoods:** Seaweed farming, octopus collecting, weaving palm leaves
B28	**Household structure:** Spouses living alone **Ages**: Husband 36, wife 25 **Marital status:** Married **Education level:** Adults: Standard 4, **Years living in this household**: 8 **Livelihoods:** Masonry and seaweed farming collecting shells (cowrie).
B29	**Household structure:** Spouses living with their children **Ages**: Husband 40+, wife 29, children 12, 6, 2 **Marital status:** Married **Education level:** Adults Standard 4 and 7, children in primary schools **Years living in this household**: 20 **Livelihoods:** Security guard, coconut farm, seaweed farming, baking and selling scones/bread), keeping goats.
B30	**Household structure:** Divorced woman living with her children, nieces and grandchild **Ages**: Woman 40, children 23, 15, nieces 5, 4, and grandchild 2 months **Marital status:** Married **Education level:** Adults Standard 4 and 7, children in secondary and primary schools **Years living in this household**: 25 **Livelihoods:** Carpentry and seaweed farming.
B31	**Household structure:** Spouses living with their children, sibling, and nephew and nieces **Ages**: Husband 52, wife 45, husband's brother 37; children 25, 22, 18, 16, nephew and nieces 16, 14, 3 **Marital status:** Married **Education level:** Adults Standard 4 and 7, children in primary schools **Years living in this household**: 31 **Livelihoods:** Fishing, seaweed farming, gardening, keeping goats.
B32	**Household structure:** Spouses living with their children **Ages**: Husband 30, wife 23, children 5, 1 **Marital status:** Married **Education level:** Adults Standard 7. **Years living in this household**: 7 **Livelihoods:** Security guard, selling snacks, keeping goats
B33	**Household structure:** Spouses living with their children and

	husband's parents (two children living with their maternal grandparents) **Ages**: Husband 38,first wife 29, second wife 29, husband's mother 56, his father 65+, children 18, 4, 4 **Marital status:** Married **Education level:** Adults completed Standard 7, children in secondary and primary schools **Years living in this household**: 25 **Livelihoods:** Security guard, has a vessel which brings in monthly income; seaweed farming, octopus collecting, gardening, keeping livestock
B34	**Household structure:** Spouses living alone **Ages**: Husband 29+, wife24 **Marital status:** Married **Education level:** Completed Standard 7 primary school **Years living in this household**: 5 **Livelihoods:** Carpentry, seaweed farming, keeping livestock
B35	**Household structure:** Spouses living with their child and siblings **Ages**: Husband 28, wife 19, siblings 23, 19, 19, 16, 14, 9, child 1 **Marital status:** Married **Education level:** Spouses completed Standard 7, siblings at secondary school **Years living in this household**: 2 **Livelihoods:** Husband employed as a cleaner at the camp.
B36	**Household structure:** Spouses living with their child and niece **Ages**: Husband 60, wife 50, child 18, niece 12 **Marital status:** Married **Education level:** Adults Standard 3, 4 and 7, child in primary school **Years living in this household**: 38 **Livelihoods:** Seaweed farming, gardening, receiving remittances from children and relatives
B37	**Household structure:** Widow living with her son, daughter-in-law and grandchildren **Ages**: Widow 60+, daughter-in-law 29, child 18, grandchildren10, 9, 4 **Marital status:** Married **Education level:** Adults not educated except daughter-in-law who has completed Standard 7, young children in primary school **Years living in this household**: - **Livelihoods:** Fishing, octopus collecting, seaweed farming, baking and selling rice bread.
B38	**Household structure:** Spouses living with their children, husband's mother and siblings **Ages**: Husband 37, wife 32, mother 55, sister 28, brother-in-law 37; children 17, 11, 7, 6, 1 **Marital status:** Married **Education level:** Adults Standard 4 and 7, children in primary school **Years living in this household**: 11 **Livelihoods:** Fishing, octopus collecting, seaweed farming, gardening, small business (snacks), keeping livestock.

B39	**Household structure:** Spouses living with their child, siblings and a niece **Ages**: Husband 42, wife 30, siblings 33, 22, child18, niece 6 **Marital status:** Married **Education level:** Adults Standard 4 and 7, children in secondary and primary schools **Years living in this household**: 14 **Livelihoods:** Security guard, small business (sugar, snacks), farming cashew nuts.
B40	**Household structure:** Spouses living with their children and grandchild **Ages**: Husband 50, wife 40, children 30, 25, grandchild 1 **Marital status:** Married **Education level:** Heads of household attended Madrasa (Arabic lessons); other completed Standard 7 **Years living in this household**: 20 **Livelihoods:** Food kiosks, fishing, selling coconuts, keeping livestock.
B41	**Household structure:** Spouses living with their children, mother, cousins and niece **Ages**: Husband 37, wife 26, husband's mother 60+; cousins 29, 27, 26, 24, children 7, 6, 5 and niece 3 months. **Marital status:** Married **Education level:** Adults Standard 4 and 7, children in secondary and primary schools **Years living in this household**: 25 **Livelihoods:** Fishing, octopus collecting, keeping livestock.
C01	**Household structure:** Widow living with her children, grandchildren and a nephew **Ages**: Widower 45; children 26, 21, 19, 14, 13, nephew 10, grandchildren 7, 5, and 2 months **Marital status:** Married **Education level:** Adults Standard 4 and 7, children in secondary and primary schools **Years living in this household**: 5 **Livelihoods:** octopus collecting and seaweed farming, farming on the mainland (coconuts, cashew-nuts, mangoes, cassava), food kiosks.
C02	**Household structure:** Spouses living with their children **Ages**: Husband 49, wife 35, children 26, 12, 8, 5 **Marital status:** Married **Education level:** Adults Standard 7, children in primary school **Years living in this household**: 27 **Livelihoods:** Fishing, a son employed as security guard, and seaweed farming.
C03	**Household structure:** Spouses living with their children and grandchild and nephew **Ages**: Husband 62, wife 42, children 26, 18, nephew 14, grandchild 1 **Marital status:** Married **Education level:** Adults Standard 4 and 7 children in primary schools

	Years living in this household: 25 **Livelihoods:** Seaweed farming, collecting shells
C04	**Household structure:** Spouses living with their children **Ages**: Husband 44, wife 38, children 20, 16, 13, 10, 6 **Marital status:** Married **Education level:** Adults Standard 7, older children dropped out in Standard 5 and 6; younger children in primary school **Years living in this household**: 22 **Livelihoods:** Fishing, octopus collecting, seaweed farming, processing fish, selling snacks, keeping livestock
C05	**Household structure:** Single woman living with her children **Ages**: Woman 30, children 18, 15, 12, 10 **Marital status:** Single **Education level:** Adult Standard 7, children in primary school **Years living in this household**: 27 **Livelihoods:** Seaweed farming, collecting shells. Son makes lime for construction and sometimes bricks
C06	**Household structure:** Spouses living with their nephew **Ages**: Husband 42, wife 37, nephew 20 **Marital status:** Married **Education level:** Secondary education and Standard 7 **Years living in this household**: 18 **Livelihoods:** Employed as operator at gas plant, wife sells cellphone top-up vouchers and juice, a nephew does nothing
C07	**Household structure:** Spouses living with their children and niece **Ages**: Husband 48, wife 35, children 14, 10, niece 5 **Marital status:** Married **Education level:** Adults Standard 7, children in primary school **Years living in this household**: 20 **Livelihoods:** Small scale business (charcoal, cellphone top-up vouchers) gardening, farming on the mainland (cassava & rice), seaweed farming
C08	**Household structure:** Widow living with her children and grandchild **Ages**: Woman 60+, children 29, 26, 20, grandchild 2 **Marital status:** Widow **Education level:** Widow did not attend school; children completed Standard 7 **Years living in this household**: - **Livelihoods:** Octopus collecting, gardening, receives remittances from her children
C09	**Household structure:** Widow living with her niece and grandchildren **Ages**: Woman 62; niece 32, grandchildren 14, 6, 4 **Marital status:** Widow **Education level:** Widow did not attend school; children completed Standard 7, **Years living in this household**: 40 **Livelihoods:** Seaweed farming, collecting cowrie shells, coconuts, receives remittances from relatives

C10	**Household structure:** Spouses living with their child **Ages**: Husband 50, wife 45, child 13 **Marital status:** Married **Education level:** Adults Standard 4, children in primary school **Years living in this household**: 32 **Livelihoods:** Fishing, seaweed farming, octopus collecting, gardening, coconuts, keeping livestock
C11	**Household structure:** Spouses living with their children **Ages**: Husband 42, wife 36, children 20, 18, 16, 6 **Marital status:** Married **Education level:** Adults Standard 7, children in primary and secondary school **Years living in this household**: 21 **Livelihoods:** Husband transports potable water to other islets for sale, octopus collecting, seaweed farming, small clothes and snack business.
C12	**Household structure:** Spouses living with their children **Ages**: Husband 32, wife 25, children 26, 12, 8, 5 **Marital status:** Married **Education level:** Adults Standard 7, children in primary school **Years living in this household**: 7 **Livelihoods:** Fishing, seaweed farming, octopus collecting, gardening
C13	**Household structure:** Spouses living with their children **Ages**: Husband 49, wife 35, children 26, 12, 8, 5 **Marital status:** Married **Education level:** Adults Standard 7, children in primary school **Years living in this household**: 27 **Livelihoods:** Fishing, seaweed farming, octopus collecting, gardening
C14	**Household structure:** Spouses living with their child **Ages**: Husband 25, wife 21, child 2 months **Marital status:** Married **Education level:** Standard 7 **Years living in this household**: 13 **Livelihoods:** Fishing, seaweed farming, octopus collecting, keeping livestock, gardening
C15	**Household structure:** Spouses living with their children, and grandchildren **Ages**: Husband 52, wife 47, children 27, 24, 15; grandchildren 9, 1 **Marital status:** Married **Education level:** Adults: did not attend school and Standard 7, children in primary school **Years living in this household**: 39 **Livelihoods: :**Fishing, seaweed farming, octopus collecting, keeping livestock, gardening
C16	**Household structure:** Spouses living with their nephew **Ages**: Husband 41, wife 33; nephew 12 **Marital status:** Married **Education level:** Adults Standard 7, child in primary school **Years living in this household**: 27

	Livelihoods: Fishing, seaweed farming, octopus collecting, keeping livestock, gardening
C17	**Household structure:** Spouses living with their children **Ages**: Husband 36, wife 25, children 5 and 9 months. **Marital status:** Married **Education level:** Standard 7 **Years living in this household**: 9 **Livelihoods:** Fishing, fish processing, keeping livestock.
C18	**Household structure:** Spouses living with their children **Ages**: Husband 45, wife 35, children 18, 16, 7 and 2. **Marital status:** Married **Education level:** Adults Standard 7, children in primary school **Years living in this household**: 20 **Livelihoods:** Fishing, seaweed farming, octopus collecting, collecting cowries, keeping livestock
C19	**Household structure:** Spouses living with their children **Ages**: Husband 45, wife 37, children 17, 15, 14, 4 and 1 **Marital status:** Married **Education level:** Adults Standard 7, children in primary school **Years living in this household**: 19 **Livelihoods:** Security guard, selling snacks, keeping livestock.
C20	**Household structure:** Spouses living with their children **Ages**: Husband 39, wife 29, children 14, and 7 **Marital status:** Married **Education level:** Adults Standard 7, children in primary school **Years living in this household**: 20 **Livelihoods:** Technician at gas plant, running a small shop.
C21	**Household structure:** Spouses living with their children **Ages**: Husband 49, wife 35, children 26, 12, 8, 5 **Marital status:** Married **Education level:** Adults Standard 7, children in primary school **Years living in this household**: 27 **Livelihoods** Fishing, seaweed farming, octopus collecting, keeping livestock, gardening
C22	**Household structure:** Single man living with siblings and nieces **Ages**: Man 30; siblings 26, 24, 23, 22, 20, 17, and nieces 13, 6 **Marital status:** Divorced **Education level:** Adults Standard 7 and secondary school drop-out (form two), children in primary school **Years living in this household**: 27 **Livelihoods** Fishing, seaweed farming, octopus collecting, keeping livestock, gardening

Appendix 8: Consent Form in Kiswahili

FOMU YA KUKUBALI KUSHIRIKI

Jina langu ni Naima Abdallah Besta, ni mwanafunzi wa Falsafa ya Udaktari (PhD) kutoka Idara ya Maendeleo (DEV) Chuo cha East Anglia, Uingereza. Ninapenda kukualika kushiriki katika utafiti mdogo unaohusu ukulima wa mwani na mahusiano ya kijinsia.

Wewe ni miongoni mwa watu wachache waliochaguliwa kushiriki katika utafiti huu katika kijiji cha Songo Songo.

Lengo la Utafiti

Lengo la utafiti huu mdogo ni kufahamu uhusiano uliopo kati ya shughuli za kimaisha za pwani hasa ukulima wa mwani na mahusiano ya kijinsia ndani ya kaya zilizopo katika maeneo ya pwani ya Tanzania.

Haki ya Kushiriki

Kama ukikubali unaweza kushiriki katika utafiti huu tunaweza kukubaliana muda muafaka wa kukutana. Vile vile una haki ya kukataa kushiriki katika utafiti huu. Una haki pia ya kukataa kujibu swali lolote ambalo unaona hutaki kulijibu wakati wa mahojiano. Vile vile una haki ya kujitoa kwenye utafiti wakati wowote wa mahojiano.

Utafiti

Nitatembelea nyumba yako na kutumia muda kama wa saa moja hivi na kukuuliza maswali kuhusu shughuli za kimaisha za watu wa pwani hasa ukulima wa mwani na mahusiano ya kinjisia katika kaya yako.

Usiri

Majibu yote yatakuwa siri na hakuna mtu atakayeweza kujua yametolewa na nani. Jina lako pamoja na la ukoo halitatokea kwenye ripoti yangu ya matokeo ya utafiti huu. Siri hiyo itakuwa kati yangu na wewe na hakuna yeyote atakayekuwa na majibu yako ila ni mimi na kwa faida ya utafiti huu.

Hatari:

Hakuna hatari yoyote ambayo inategemewa kutokea kutokana na utafiti huu na iwapo unaswali lolote kuhusu utafiti huu unaweza kuniuliza sasa hivi au baadaye kwa kutumia anuani ifuatayo:

Naima Abdallah Besta, S.L.P 76249 Dar es Salaam, simu no. 0783 674080

Kukubali kushiriki

Nimeelewa maelezo yanayohusiana na utafiti huu. Na ninakubali [ ] Ninakataa [ ] kushiriki.

Sahihi ya Mshiriki ..... Tarehe.....
Sahihi ya Mtafiti..... Tarehe.....
Ruhusa ya Maneno..... Tarehe.....
Kama umekubali tarehe ya kukutana kwa mahojiano.....