

STEP

Seafood Trade,
Ecosystems and People

Preliminary Report

An analysis of small-scale fisheries value chains, market structures and benefits in Unguja, Zanzibar



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The project in brief

Small-scale fishery governance has often taken a narrowly approach to sustainability, focusing either on managing fishing activities, or market-based interventions and overlooking the embeddedness of fishers within a broader social structure. This project uses a value chain approach to address these gaps. The aim is to improve our understanding of the interplay between fisheries governance and market dynamics, and the effects of this on benefit flows and distribution of marine ecosystem services. This report contains preliminary results and examines the social dynamics among fishers and traders that may impact benefit flows and ultimately resource extraction decisions.

The data presented in this report form part of a larger project also aiming to uncover the role of seafood markets and market actors, like traders, in mediating interactions between the social and ecological components in local Small-Scale Fisheries systems.

1. Introduction

Small-scale fisheries (SSF) are frequently cited as necessary for sustainable poverty alleviation in coastal areas worldwide and in academia much work has been done to understand the connections between poverty, SSF seafood trade, food, and livelihood security. Although people benefit in various ways from their involvement in SSF markets, for example access to protein, reciprocities, cash and employment, development policies have often focused on economic growth and intensifying international seafood trade links. While important, this focus does not appear to have markedly reduced poverty levels in many SSF. Case studies continuously show that small-scale primary producers receive the lowest economic benefits relative to other value chain actors. In SSF exporting to international (often western) markets, there are particularly stark contrasts between benefits gained by local producers versus the corporate interests involved.

Various factors or contextual features can impact benefit flows. For example women and men often earn different incomes and take on differing roles in the fish value chain. Benefit flows can also be affected by patron-client relationships, or other forms of credit arrangements between actors in the fish value chain. Finally, differences in end consumers has impacts on the price of products but also on the market access of various actors in the fish value chain. However, which groups (beyond fishers) benefit from SFF, and how such benefits are distributed, remains poorly understood. To address this, and to disentangle the market features and social mechanisms that impact SSF benefit flows and distribution, the first part of this project asks: Who and how do market chain actors benefit from SSF? This is done in Unguja Island, Zanzibar.

2. Methodological approach

To understand who is involved, this study makes use of a Value Chain (VC) approach with a focus on gender and market interactions. A VC analysis is one way to examine market structures (i.e. identity, size and numbers of traders/fishers and product-types they deal with), while also assessing the relationships among actors and subsequently understanding the market conduct (i.e., buying and selling, pricing) this gives rise to. Simply put, a VC is conceptualized as a set of nodes (representing a particular actor type with a particular function in the fish value chain), and the relations between them. VC analysis is increasingly employed as an approach towards developing markets to benefit small-agricultural producers.

To understand benefit distribution among SSF and market actors, net income is assessed across value chain nodes (actor types) and gender. Levels of inequality within and between actor types are then calculated.

Contractual arrangements between seafood market actors are examined as a means to understand the mechanisms behind the observed benefit flows and distribution. Academic studies across the world show that fisher-trader relations can have an impact on fishers' conduct, decision-making, and income, and thus, on the distribution of benefits stemming from seafood extraction and trade. By channeling flows of various kinds between fishers and the rest of society (e.g. market demand, cash, products, information) traders play an important linking function between markets, fishers, and fish stocks. Therefore the arrangements (i.e., contracts, deals) between traders and other actors at various points in the value chain can facilitate the channeling of benefits but can also potentially hinder them. In spite of this traders are rarely taken into account or included in formal fisheries governance.

Finally, we are interested in understanding benefit distribution beyond simply the net income of trade. As is well documented in many fishing societies, transactions in the value chain are not purely economic but also involve reciprocities and connections based on residency, kinship, and custom. Consequently, this paper also examines the broader set of relations in which the fishers and traders are situated to get a more holistic understanding of who receives non-trade related benefits (such as food, credit, and cash, flow). This analysis includes both primary (e.g., traders, fishers) and secondary or auxiliary (e.g., processors, auctioneers, and boat repairers) market actors.

A gender sensitive lens is applied in the analysis since gender emerges as an important factor to consider when aiming to understand SSF seafood trade participation and the associated benefits. Incidentally, gender has often also been ignored and unrepresented. This has resulted in women's market chain functions, and their contributions and dependencies, often remaining invisible. However, if SSF governance is to contribute to sustainable livelihoods and food security across a broad demographic, the roles of gender and market relations need to be considered as a means to unpack current benefit flows.

2.1 Description of Cases: Unguja Island, Zanzibar



Figure 1: Map of Unguja Island, Zanzibar with 8 sampling sites as small dots, in respect to Tanzania mainland (left).

This study relies on primary data collected through structured interviews, semi-structure in-depth interviews and participant observation with fishers and trading actors in Unguja Island, Zanzibar, hereafter Unguja (July 2014, September 2014-March 2015). Respondents were selected based on their involvement in the value chain and were interviewed at landing sites, markets and ports (see Figure 1 for a map of the areas covered and Table 1 for respondent numbers). Traders in this study refer to any actor buying and selling fresh or processed fish, both male or female, mobile or market based. Not all nodes or node groups within the chains could be captured for various logistical reasons. Sampling included nine landing sites: Malindi, Mkokotoni, Kizingo, Mazizini, Kizimkazi Djambiani, Nungwi, Buyuu, Uroa, Maruhubi as well as the central market Darajani.

Table 1: Respondent information for fieldwork campaign 2014/5

Country/Site	Respondent Type	Gender	Total n sampled
Unguja	Fishers	Female	5
	Fishers	Male	195
	Traders	Female	63
	Traders	Male	109
<i>Total n= 372</i>			

2.2 Mapping the Seafood Market

All survey data was entered into Microsoft Excel and subsequently imported into Microsoft Access for easier handling, storage, and querying. Actors were characterized into different types (from hereon referred to as nodes) based on a range of factors. The research followed Bolwig et al (2010) and used 'nodes' to denote a point in the VC where a product is exchanged or goes through a major transformation or processing (see figure 2 to see the different types of nodes in this study). Gender was used as a primary factor as men and women fulfill different roles in the Zanzibari system (Fröcklin et al. 2013, 2014, de la Torre-Castro et al. 2014), and in many SSF systems in general (Williams 2008, Siason et al. 2010, Harper et al. 2013, Lentisco & Lee 2015). Actors were then categorized on the basis of location for their activities (urban: in Zanzibar Town/rural: the Shamba landing sites). For fishers, gear types, vessel-use, vessel sizes, propulsion, species groups, secondary vessel use, gender and location type were combined to identify fishing styles or segments. For traders, categories were created based on primary processing activities used (e.g. frying, boiling/drying, gutting, filleting, sorting), their main purchase and sales locations, and then their primary sales paths i.e. local communities or hotel and export connections. So few women fishers were interviewed as they were hard to contact and/or had limited time available as a result of various domestic-related duties.

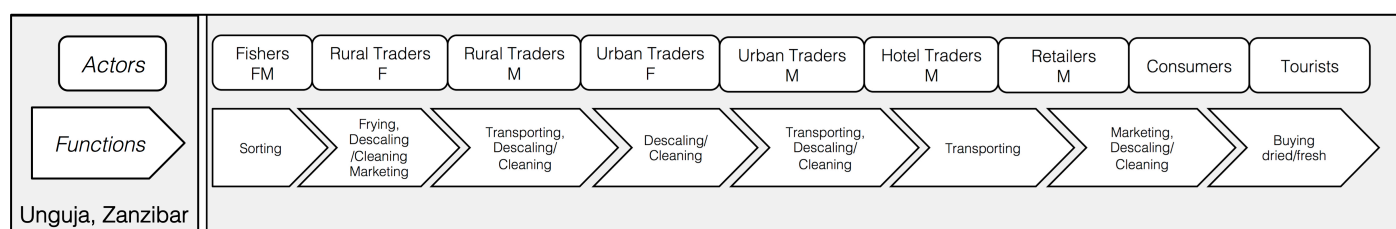


Figure 2: The actors and functions they fulfill in the value chain in Unguja, grouped into nodes, the boxes. F= female actors, M= male actors

2.3 Analysis of income and relative inequality

Income analysis was conducted in two parts. First, trader and fisher net incomes were calculated using running costs (R), average kilograms landed or traded per day (Q), crew or partner numbers (P) and average sales and/or buying prices per day per kilo (Sp-Sales, Pp-Purchases). Quantities and prices were averaged according to biannual seasons in each location based on either trade or monsoon winds. All income data was converted to International US Dollars from Tanzanian Shilling using the appropriate purchasing power parity PPP conversion factors (C) (Factfish 2016). PPP refers to the number of units of a country's currency required to buy the same amounts of goods and services in the domestic market as U.S. dollar would buy in the United States (Factfish 2016). This conversion thus allows us to compare income data from the Zanzibar with other countries. Fisher Net Income (If) in International US Dollars per person per day was then calculated as:

$$If = [(Sp/C*Q) / P] - R$$

Trader net income (It) calculations additionally included purchases prices (Pp):

$$It = \{[(Sp - Pp) / C] * Q\} / P - R$$

The resulting income data was then examined through scatter- and boxplots and all outliers individually checked using original questionnaire manuscripts to ensure their validity. Responses that were identified as incorrect or highly implausible were not used. Data normality was analyzed in R (Ripley 2001) with Shapiro Wilks tests, histograms and Q-Q plots prior further statistical analysis. Then tests for statistically significant dependencies were done between income and the variables gender and location type. This was done with a non-parametric Mann-Whitney-Wilcoxon-test.

Degree of income inequality was examined within and between nodes of the VC using Lorenz curves (graphic measure) and the corresponding Gini coefficients (Gastwirth 1972, Kakwani 1977) to assess economic benefit distributions or flows within the different fisheries. Lorenz curves were made in Microsoft Excel by graphing the cumulative percentage of income (Y axis) against the cumulative percentage of people within the sample (X axis). The resulting curve was compared to the line of perfect equality, which represents 100% income equality.

To understand what factors may be driving the patterns of inequality observed the differences in income between actors based on gender, contractual arrangements and primary market channel targeted (tourism-, consumer-based) were then examined. Gender was included because of the documented gender division within seafood. Furthermore, the VC mapping revealed that actor types could clearly be differentiated according to primarily urban or rural operations. This variable was therefore included in the quantitative analysis to examine if location matters in explaining within and between group income inequalities.

2.4 Market Conduct & Assistance

Both fishers' and traders' predetermined sales deals (an agreement, contract or exchange, formal or informal between two or more actors which is potentially favorable to one or more of the parties) were examined to understand market conduct, e.g. where fishers market to one

particular trading actor in return for favors i.e. loans, fuel. Fishers ultimately become ‘tied’ to these trading actors, unless they repay favors. To capture additional benefit flows (beyond economic benefits of market participation) in the fisheries system assistance between and among actor types (nodes) was tracked. This assistance included both material (i.e. fishing gear, vessels, money, fish, food) and/or services (processing help, transport help, assistance at sea, vessel aid etc.).

3. Results

3.1 Market Structure

Who is benefiting from involvement in the fisheries? To answer this question we first mapped existing market structures. Figures 3 and 4 show the different actor types involved in the trade of mixed reef (coral reef associated smaller bodied species e.g. pono, tasi, mkundaji), small pelagic (e.g. dagaa, vibua) and octopus around Unguja. Figure 3 shows the sales transactions between fishers, traders and consumers in urban and rural settings. Both rural and urban transactions are structured similarly.

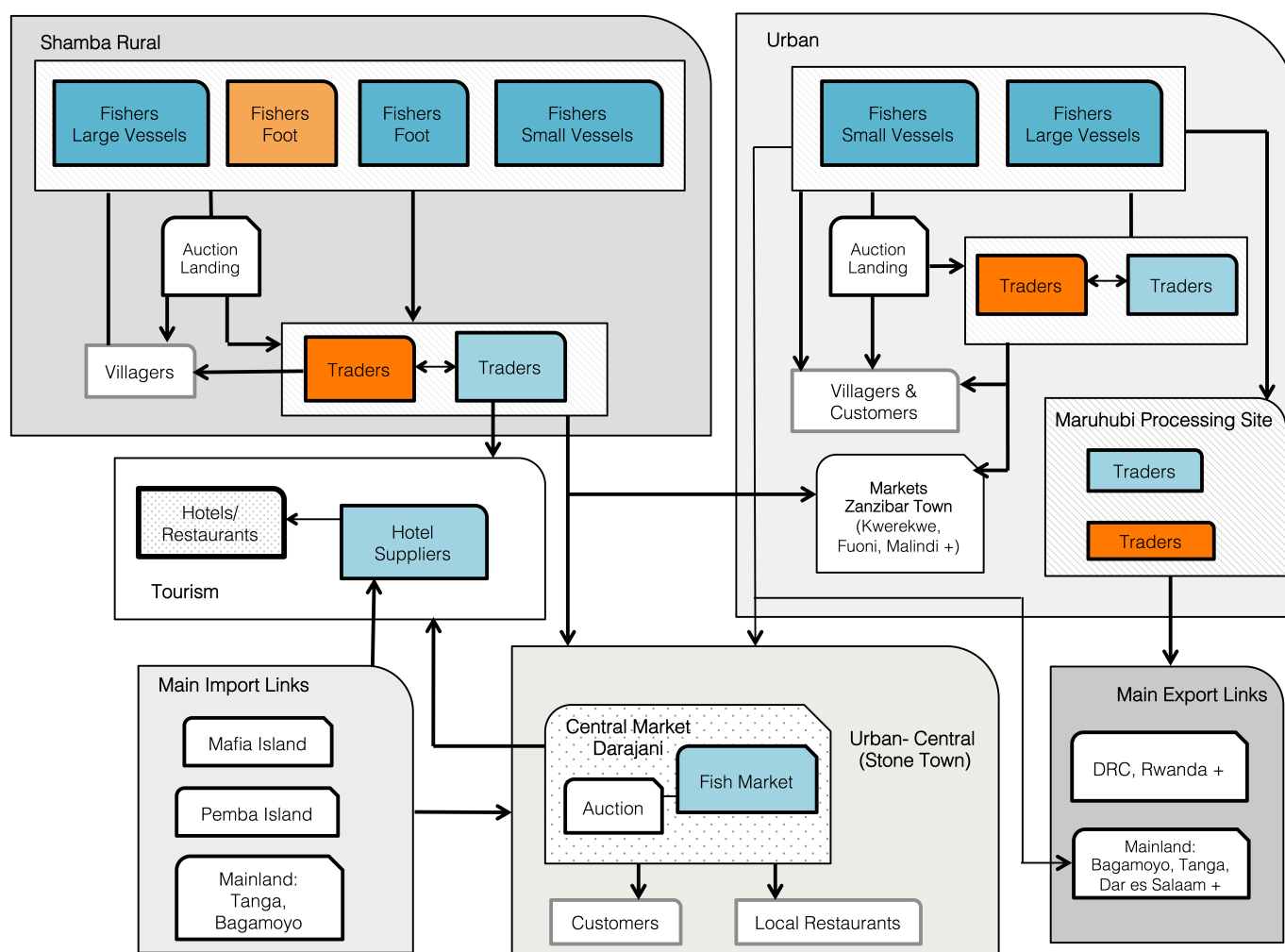


Figure 3: Formal Market Structure of Value Chains of Interest (Small Mixed Reef Fish, Small Pelagics, Octopus) in Unguja Zanzibar. Arrows represent the business transactions between nodes, markets and other actors i.e. exchange of products in formal transactions. Female nodes are coloured in orange while male nodes are blue. Foot fishers represent those who do not use vessels to access the seascape. Large vessels include Daus, Mashuas, Botis. Smaller vessels include mtumbwis and ngalawas. Fisher types are grouped into white boxes for urban and rural areas, indicating that all the fisher types inside sell this way.

Some sell directly to tourism-linked market channels or at the central Darajani Market. The five female fishers that were interviewed in Kizimkazi Djambiani are all selling octopus to a tourist resort nearby, in addition to local consumers. Despite long distances from their purchasing sites male rural traders are highly connected to the centre of Unguja (Darajani, Stone Town), only a very small percentage of rural female traders sell there, primarily trading from their homes to local customers. Urban women traders also have few direct trade connections to fishers and instead buy most of their fish through auctions at the landing sites. In general women traders also have very limited trade connections with the tourism industry. Noteworthy is the import link via the hotel supplier and Darajani Fish market traders who are importing from auctions and fishers in Pemba, Bagamoyo, Mafia and Tanga suggesting their target products are not available in either sufficient supply and/or at suitable prices in the Unguja system so are being sourced elsewhere. Export of dagaa is happening in large quantities from Maruhubi to mainland (for retail and to chicken feed factories) and across the continent towards Kinshasa.

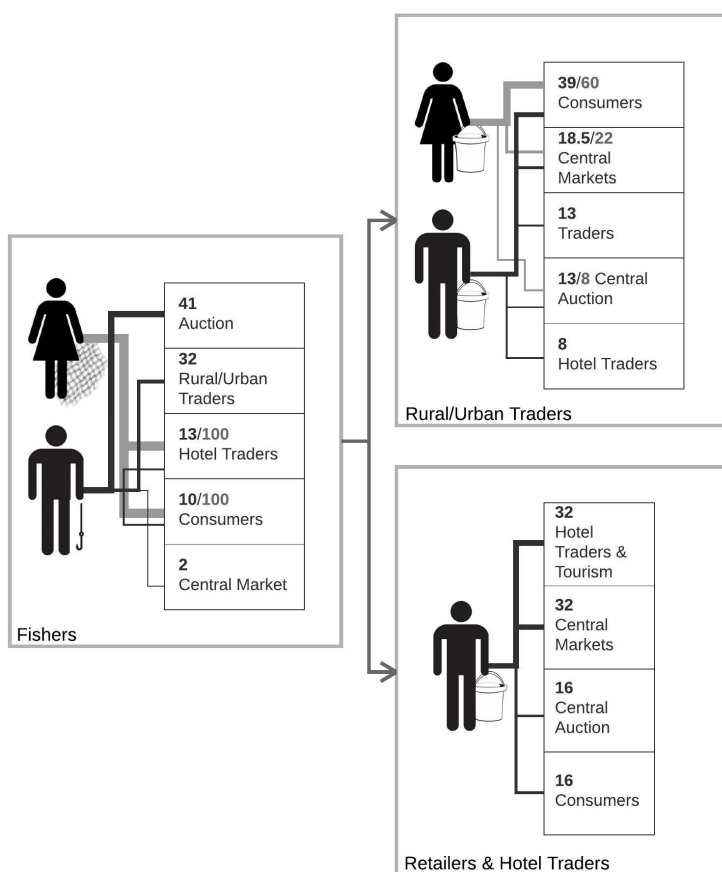


Figure 4: The Market structures for Concepcion. Each box represents the nodes in the study systems and then within the boxes in the tables, the various nodes to where they sell. The different sized lines in the diagram represent qualitatively the commonality of these sales to each node mentioned by respondents, seen in the small tables within the boxes. Numerical values stand for the % response frequency. Not all nodes included in the smaller tables were interviewed, only those nodes or node groups represented by the larger boxes and illustrations.

Figure 4 presents the response frequencies of the different sales paths according to respondents and highlights more quantitatively that women traders (grey lines) largely serve local consumption whereas men serve more equally consumers, central markets and the central auction.

3.2 Barriers to entry

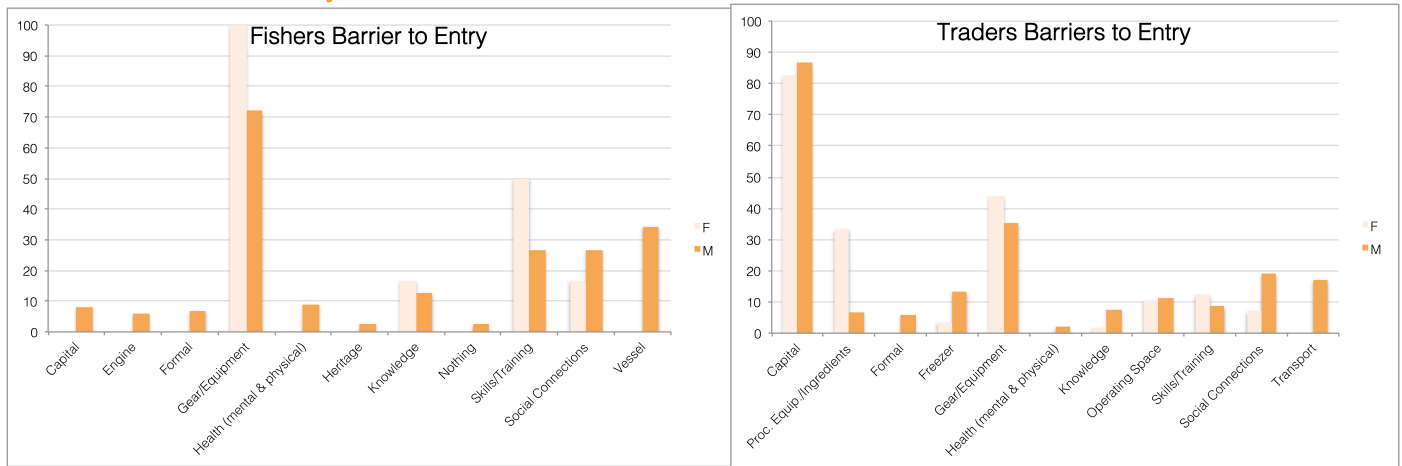


Figure 5: Categories for barriers to entry into the value chains in Unguja according to respondents interview answers. Traders here include retailers, hotel traders, traders at rural and urban landing sites. F represents the female actors in lighter orange and M the male in the darker shade. Proc. Equip./ingredients relates to items needed for drying, frying or boiling.

Both trading and fishing actors were asked what they needed to enter the VC; 100% of female fishers and 70% of male fishers required gear and equipment. Only fishermen needed vessels to start (over 30%) and between 20-25 percent felt that besides material needs skills, training, knowledge (of habitats, gear use, methods) and social connections (especially to crew members already on vessels) were necessary. Further downstream at the trading nodes the biggest barrier to enter the chain was financial capital, with over 80% of both men (on average 400,000 TSH) and women (on average 70,000 TSH) requiring it. Related to the different business models between the genders women traders reported needing processing equipment and ingredients while in contrast only men reported needed some type of transport.

3.3 Benefit distribution and inequality

3.3.1 Net income distribution and inequality across gender

Examination of income inequality among actors showed a rather high Gini coefficient for Unguja (0.563) indicating that at the level of the entire fisheries, 56.3% of the population hold only about 18% of the wealth (net income) and 90% of the population hold only 40% (see Figure 6 below). A Gini coefficient value greater than 0.35 is generally interpreted as indicating inequitable distribution of incomes where wealth is concentrated among a few individuals (Alfoabi 2007, Dillon and Hardaker 1993).

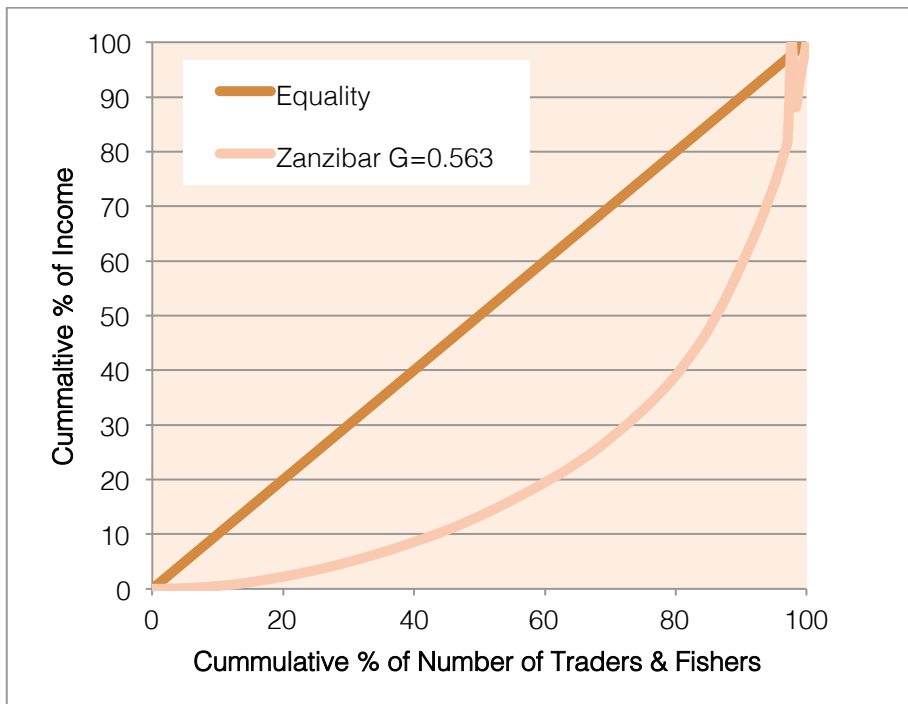


Figure 6: Lorenz curve with Gini coefficient inserted for all actors interviewed in the field campaign 2015/15. The dark orange straight line represents the line of perfect equality where all actors share the wealth equally. The further the curve is from this line the more unequal a system is.

When income distributions are further unpacked the largest discrepancies between nodes are found between rural (low Gini) and urban traders as well as between female (low Gini) and male traders (Figure 7). These results indicate that women are more equal in terms of their net income while amongst male traders there is larger inequality in income levels. The same can be said of the traders based in rural sites whom also share more similar income levels while their urban counterparts exhibit a wider range of net income levels.

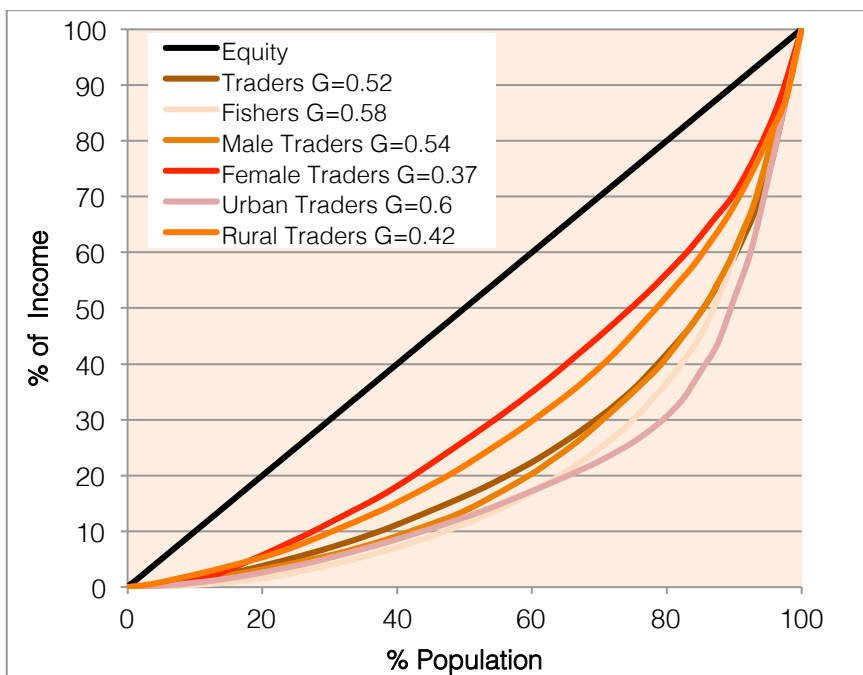


Figure 7: Lorenz curve and gini coefficients between different actor groups, traders, fishers, male/female traders and urban/rural traders.

An interesting finding is the fact that in Unguja, where women are fairly segregated in the VC and play a very specific role (e.g. frying fish and selling to local consumers), there is a significant difference in their average earnings compared to male traders, even though men's income spans a wider range (See Figure 8).

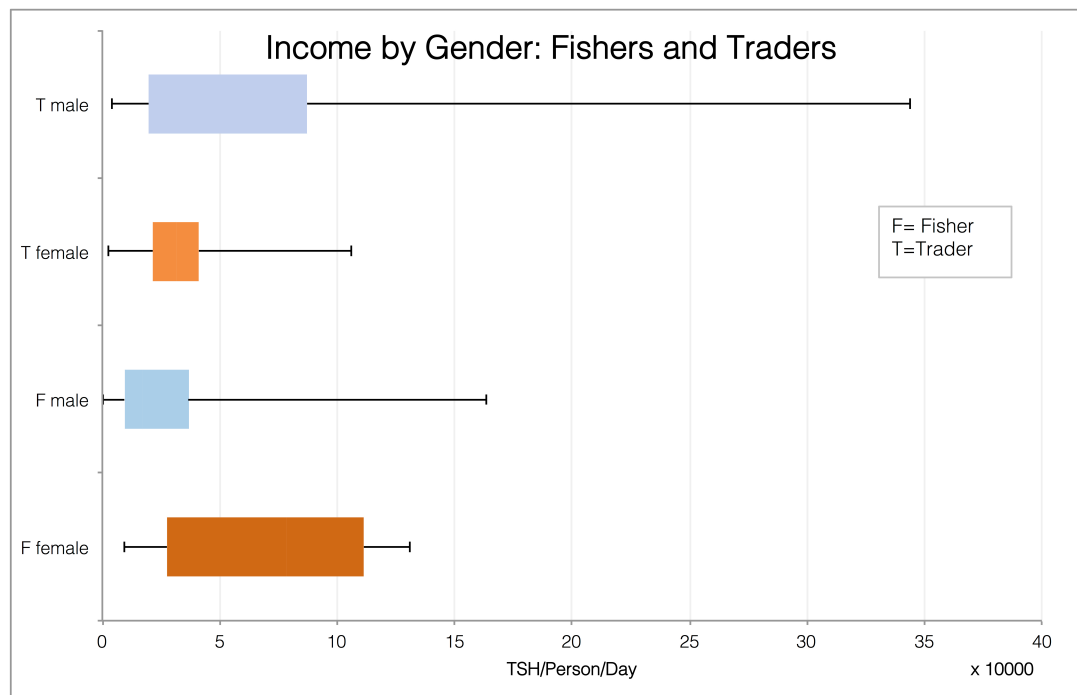


Figure 8: Net income in Tanzanian Shilling per person per day according to running costs, sales prices, purchase prices and quantities of products reported. Female fisher and trading nodes are represented in the oranges and the blue are male.

Comparing the income distributions of actors who sell to hotels and/or to hotel traders/suppliers with those who are unlinked to tourism (figure 9 below) shows that traders who sell to hotels report higher daily average incomes than their non-tourist linked counterparts. However, the data exhibits a large positive skew and hence the difference is not statistically significant. For fishers there is no difference. Possible drivers of this skew include the traders who supply larger quantities, between 50 and 150 kg per day, of high-value mixed reef species direct to hotel actors.

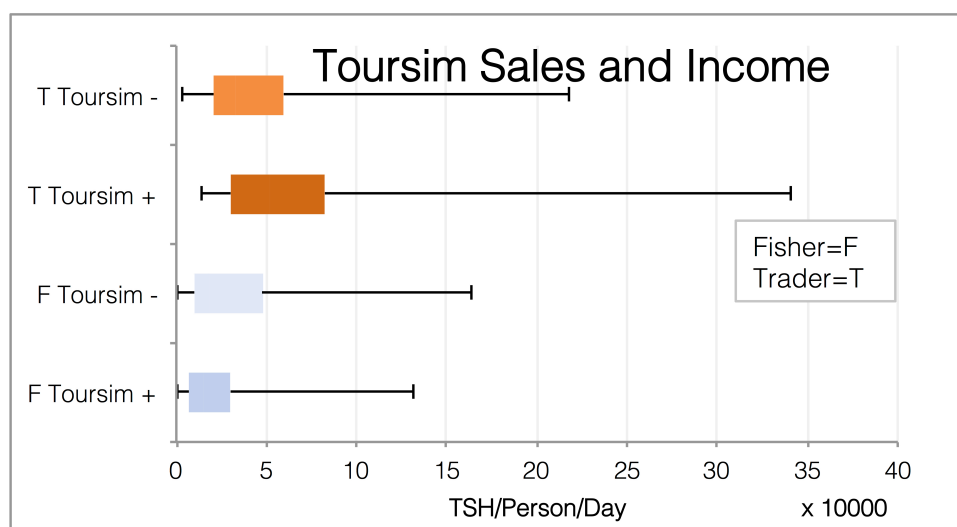


Figure 9: Net income in Tanzanian Shilling per person per day according to running costs, sales prices, purchase prices and quantities of products reported. Trading nodes are in blue and fishing in orange. The plus sign signifies a connection to the tourist industry, either selling directly to hotels or to hotel suppliers and traders. The negative sign represents those who do not serve the tourist market.

Examining fishers' net income, with or without sales deals, shows that actors with deals earn a significantly lower income than their counterparts with deals (Figure 10), an expected result as those without deals have more flexibility in sales choices i.e. more options to sell to buyers offering high prices. However at the trading level those with deals receive a higher daily net income, again with a large positive skew. In general and in line with most income data reported from SSF fishers earn significantly less than traders.

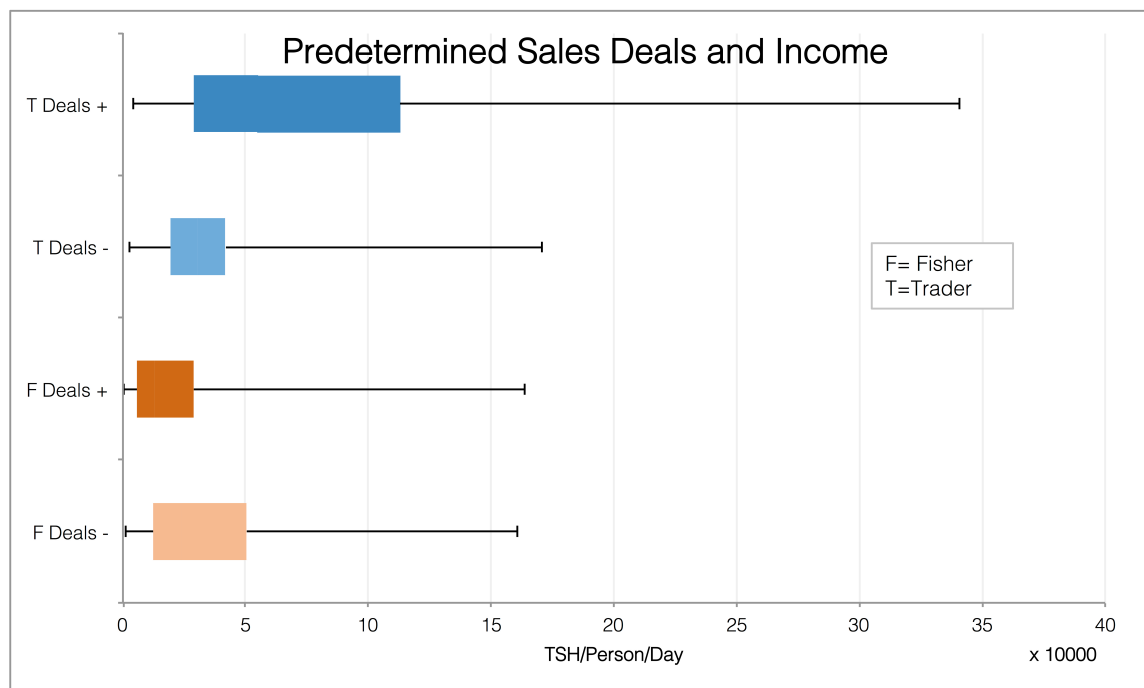


Figure 10: Net income in Tanzanian Shilling per person per day according to running costs, sales prices, purchase prices and quantities of products reported. Trading nodes are in blue and fishing in orange. Those fishers and trading actors that sell through deals have a plus sign and those who sell via auction and on-the-spot have a minus sign.

3.4 Relationships in the Market Place and Benefit Distribution

3.4.1 Predetermined Sales Deals

As patron-client type relationships tend to be frequently observed in SSF examining the nature of these predetermined deals, and their prevalence, is important for understanding how, if at all, they affect the benefits that actors capture as a result of their market place participation. Regardless of the degree of formalization surrounding such trade-actor relations, they have the potential to both affect net income, which can be seen in the results above, as well as be a source of additional benefits (as elaborated below). This section first outlines the nature of the relations and then assesses their prevalence.

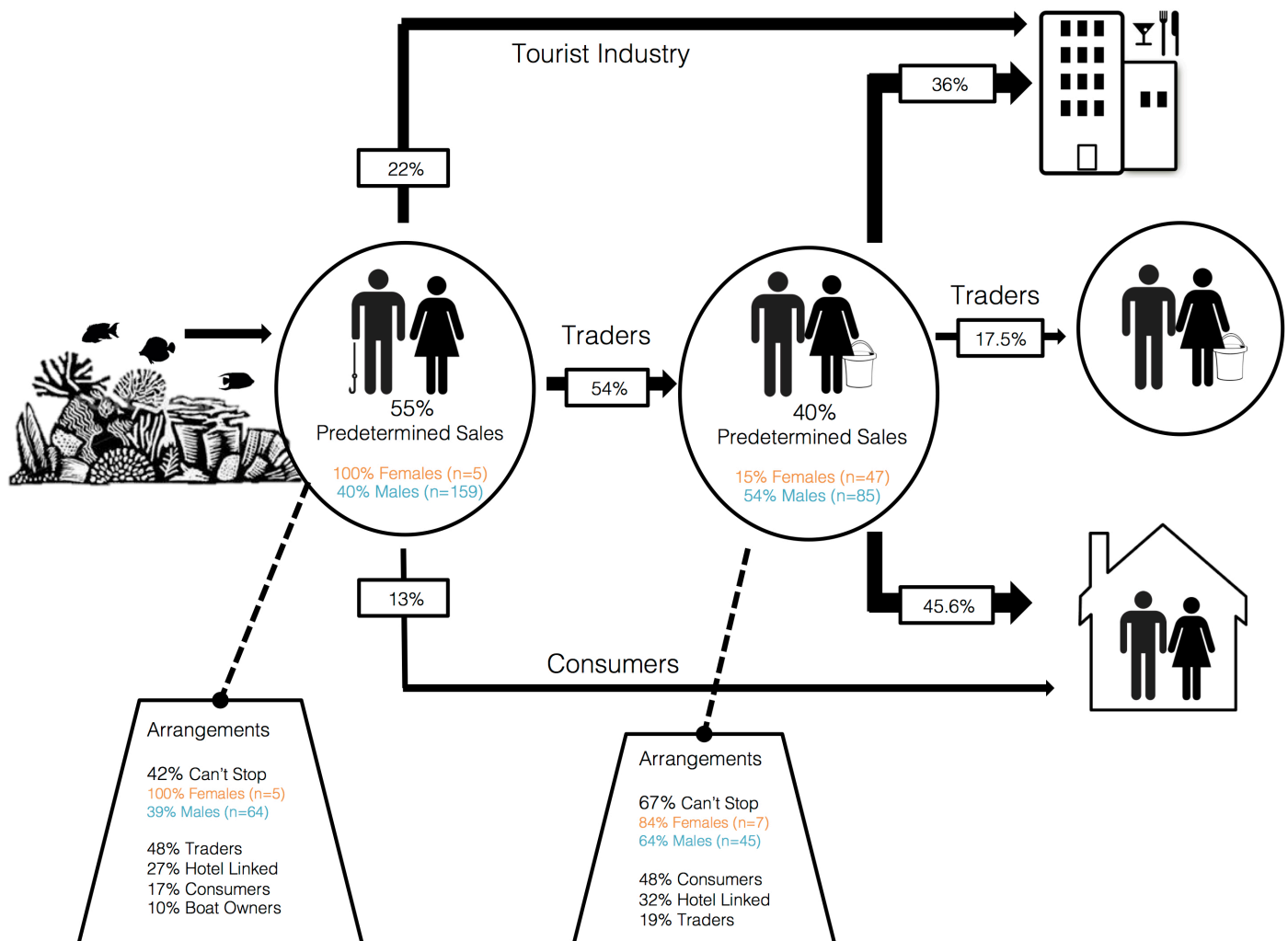


Figure 11: The main predetermined arrangements in the Small Scale Fisheries in Unguja, 55% of fishers define their sales as predetermined (circled in left of figure), 40% of trader respondents saw their own sales as pre-arranged (middle circle in figure). The arrows show to whom (and the proportion of respondents %) the fishers or traders are dealing with in their pre-arranged sales. Only the most frequent sales paths are presented here. The boxes on the bottom show how many respondents felt they couldn't stop their deals, and how many of these people are selling to which path e.g. to other traders, to hotels.

We found that 55% (Figure 11) of fishers described their sales arrangements as predetermined, i.e. they are selling continuously to the same buyer. While only five female fishers were interviewed, their main types of sales are predetermined and all with the same resort near their home, the resort targeted both male and female octopus fishers in the area. Male fishers using nets also have a higher frequency of deals while those least likely to report predetermined sales were male fishers in the urban sites with both small and large vessels and mainly using fish traps. The majority of fishers (51.5% n=71) reporting such sales arrangements entered these via random chance through meetings at the landing site, buyers approached them and through an exchange they made oral business deals to continuously deal with one another. Some fishers are connected to the same buyer because they are either neighbors, relatives or friends, thus they end up continuously selling to these customers out of social obligation more than economic imperative. When asked if they could terminate the arrangements and not sell to this buyer anymore, 42% of the fishing respondents felt they could not stop, citing misunderstandings, profit loss and the fact that they would not be able to get any more help from the buyer in question, as the main reasons.

While literature has largely focused on sales arrangements between fishers and traders, traders too have their predetermined customers. In this Zanzibar sample 40% of traders interviewed identified their sales deals as non-random or prearranged (Figure 11). The node types most heavily involved in sales deals are the male traders with rented spaces in the Darajani fish market (66.7% of respondents in the node, n=9). Following them, the nodes with highest frequency were the rural males selling mainly to hotel traders and at Darajani (58.33%, n=24) and another rural group selling directly to hotels (57%, n=14). Female traders appear to have very few predetermined buyers, with only 15% (n=47) of women traders (largely rural and all frying the products) reporting arrangements primarily to local consumers. As with fishers, traders seem to start these arrangements more from chance or random meetings at landing sites or markets (50% of those with arrangements) as oppose to strategic choice (only 12% of respondents). When asked if they could stop these deals 67% felt they could not, decidedly more than the fishers. However the same reasons, i.e. loss in profit, causing misunderstandings and or that business would stop altogether, were mentioned.

A substantial percentage of male fishers and traders have both predetermined customers and perceived binding deals. While such predetermined sales arguably have the potential to impact decision-making through the pressure to continue the deal fishers felt less bound by their deals than the traders.

3.4.2 Beyond Sales: Benefit flows through Assistance

Surveys show that people in the market place nurture relations above and beyond mere sales transactions and these appear to be important for the functioning of the marketplace. The most commonly mentioned non-sales related relations in this study were linked to various forms of assistance or help. Figure 12 is a representation of the context in which these take place in Unguja and shows assistance flows between actors. The figure reveals a more complex array of people's relationships and indicates that expanding the scope of analysis of seafood trade uncovers a web of connections that go far beyond simple sales contracts.

As the analytical lens is widened the new actors who appear include the Dalali (the auctioneer), Boat Owners, the Fishing or Market Committees, and the Papasi. Papasi (meaning tick in Kiswahili) refers to generally young boys based at landing sites throughout Unguja who provide various services for both fishers and traders. Papasi chiefly carry products for crews or for traders, from the vessel up to the market building or from the market building to other places. They will also help to process different product types, often beating the octopus and descaling and/or gutting fish. Almost every node is connected to these actors by providing and/or receiving assistance. Only the five female fishers appear to remain unconnected to them. All other node types are constantly providing Papasi with products for home consumption and some money (usually small amount <10,000Tsh) as a way of assistance when Papasi are in need. Papasi too return the favour and all fishers except male and female foot fishers (i.e. fishing without vessel)

receive some money and/or fish for home-use when they themselves need. In the rural areas fishers are more strongly connected to Papasi (36.5% of respondents in the rural areas versus 16% in urban areas) through provision of assistance and additionally noteworthy is the activeness of the Fishing Committees in the rural areas where 22 (n=120, all males) respondents said they are frequently connected through assistance as oppose to none of the urban fishers (n=38).

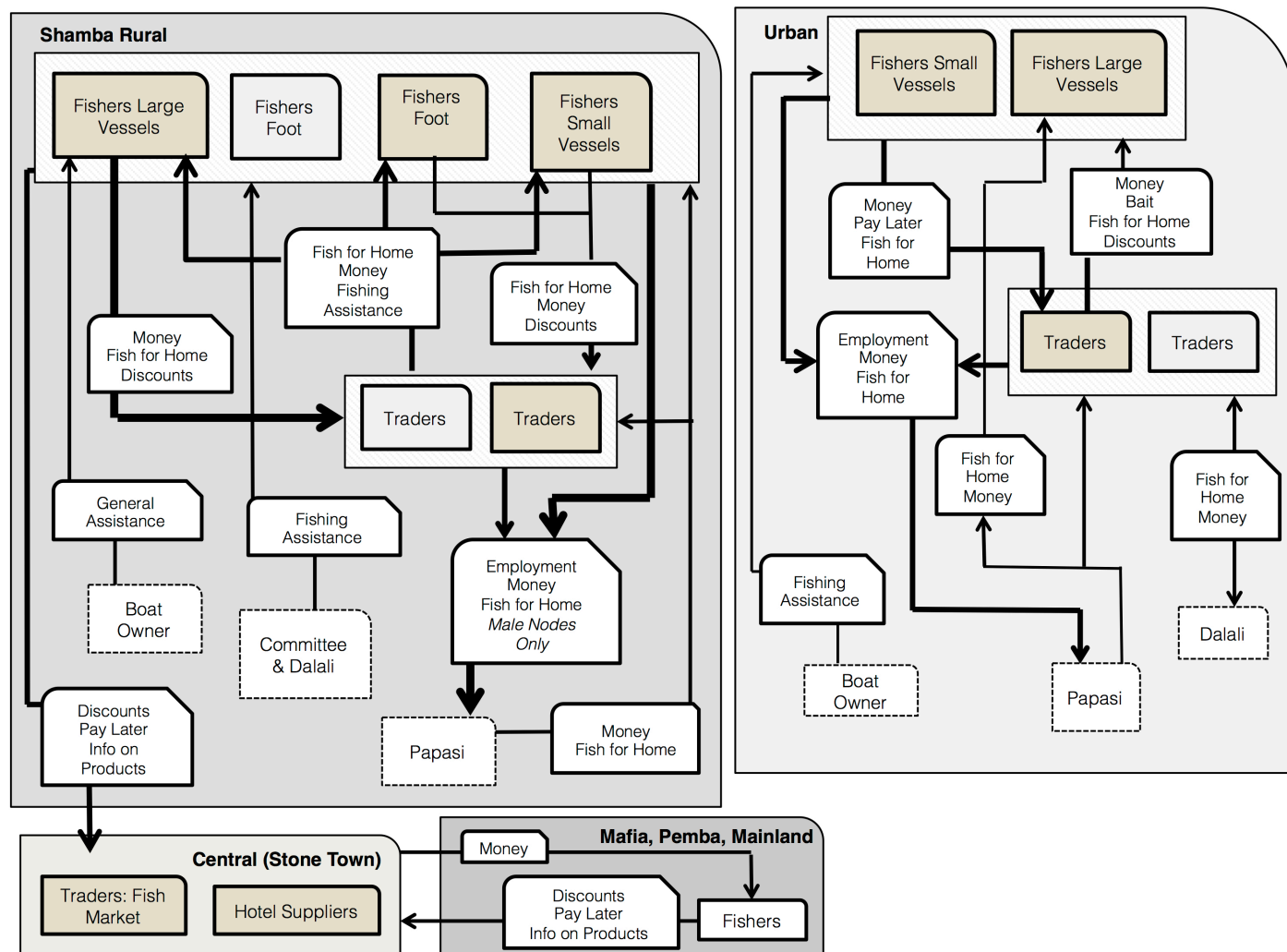


Figure 12: The Seafood Market System structure in terms of the flow of assistance between actors. Value Chains of Interest (Small Mixed Reef Fish & Octopus) are mapped. The arrows represent the flow of assistance between actors, larger lines representing a stronger movement of help between actors. This map shows the non-capitalized transactions that exist in this Small Scale Fisheries where money, seafood, bait, petrol and general assistance moves between nodes of all types and also to and from secondary actors e.g. Papasi (Boys around landing sites who help to process and or carry products), Dalali (Auctioneer) and Boat Owners. Female nodes are coloured in lighter grey while male nodes are darker. Three arrow sizes are presented qualitatively to show the commonality of the interactions.

Help also flows from all male fisher types, to the traders, and this assistance flow appears to be more prevalent in the rural site, particularly from male fishers with large vessels. They all in fact provide more support than they themselves receive. Figure 13 below shows that 59% of rural male fishers provide traders with continued support. Of women traders based in rural areas, 40% are receiving assistance from fishers while this is much higher for males in the same areas (67%). In the urban sites hardly any female traders are involved in exchanges of assistance with fishers, none receive help at all, yet 37% of their male counterparts in the same areas received continuous help. The main type of received help cited by traders overall was fish for home use

and the option to pay fishers later rather than on-the-spot-. Another frequent type of support provided by the fishers included discounts for the traders.

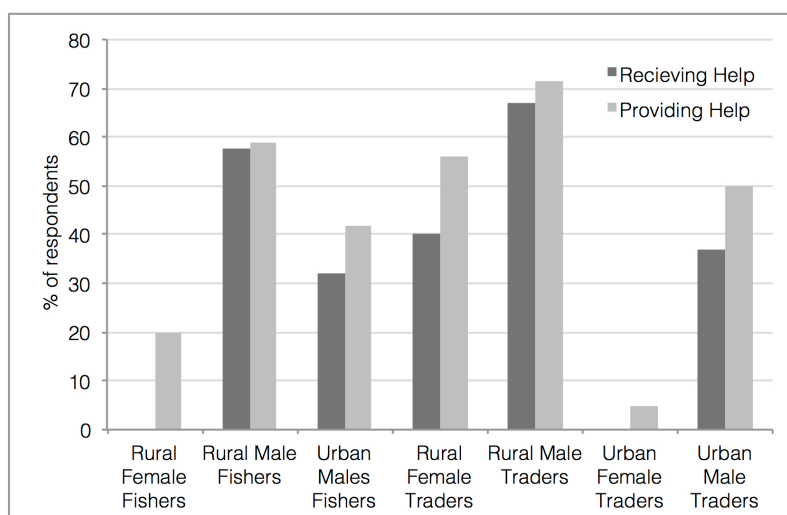


Figure 13: Assistance between traders and fishers. The y axis represents the percentage of respondents in each node group who said they are continuously receiving or providing help from or to the other actor group i.e. fishers giving or receiving from traders and traders giving or receiving from fishers.

The number of fishers frequently receiving help from traders varies between groups (see figure 5), ranging from 20% (rural female foot fishers) and 32% (urban male fishers) up to 57.5% of rural male fishers, primarily those using handlines and nets, on both large and small vessels. When asked to elaborate, the help cited by the female fisher is actually just the traders buying her products, so she does not receive any material or non-sales related service help from traders. Rurally-based male fishers receive a lot more assistance than their female counterparts, frequently citing help in the form of money or products for home consumption. The trader node providing most assistance to fishers are the male rural traders (71.5%), including money (for general use, for fuel, to fix their gear) and fuel. Only 4.8% of urban female traders give fishers help commonly however the women based in rural areas are much more frequently connected through assistance flows to fishers (56%). Overall, the main type of help traders provide fishers is money for general use, gear, fuel where relevant, food and to fix gears or vessels. Secondly they provide fishers with seafood for home and, to some fishers, bait and fuel.

The import link (Figure 12) to Mafia, Pemba and mainland Tanzania is interesting as it provides evidence of assistance flows spanning large geographic distances. Urban males traders on Unguja provide money to fishers (e.g. for fuel, fixing gear) outside of Unguja and at the same time they receive constant help in the form of discounts, information on landings and the possibility to postpone payment which is important for small-scale traders with limited cash flow. Notably no actor from the tourism industry is represented among the assistance relations. As such tourism and the new market it brings to Zanzibar does not appear linked to the informal but vital relational network of the SSF system.

4. Discussion and Reflections

Summarizing the findings, the Unguja market place is characterized by a large number of buyers and on-the-spot transaction types, local consumers play an important role in market dynamics, and are frequently involved in contracts through predetermined arrangements. Economic exchanges revolve around provision of favours, food and help, while social standing and obligations play a role in determining how people sell their products. Below we discuss what these general features mean for the participation of various actors in seafood trade and how these observed structures affect how they benefit.



Figure 14: Interviewing in Mkokotoni November 2014.

4.2 Participation in the Seafood Market

The role of women in SSF VC has been largely invisible in history with men's' fishing activities capturing the primary attention. However, although frequently observed to be marginalized from various VC positions and decision-making processes, women have been shown to play a critical role at every link in these VCs (De Silva 2011, Lentisco & Lee 2015). Generally speaking, women in fishing communities across the world appear to face barriers to higher-income generating roles in the supply chain due to various cultural obstacles and conflicting household roles (De Silva 2011, Matsue et al. 2014). This is notable in Zanzibar as well. The SSF structure in Unguja indicates that male and female traders occupy quite different roles in the seafood trade. Women in the rural sites run largely home-based businesses supplying the local villages with processed products, dried or fried. This is typical due traditional divisions of labour where women more than often occupy home and domestic spaces, which also limits the time they can devote to work outside the home e.g. wage labour or post harvest work (Yahaya 1988, Williams 2001, De Silva 2011, Fröcklin et al. 2013, Monfort 2015, De Silva 2011, FAO 2017).

Contrary to women traders male traders have more fish marketing options, including selling from bicycles, to a greater variety of customers in town and to the tourist hotels. Men therefore have access to the higher sales prices in town and at the same time the lower purchase prices at the rural landing sites (Fröcklin et al. 2013). The five women fishers interviewed have accessed a unique opportunity in sales to the nearby tourist resort which does not seem to be the norm within this fishery system, further downstream women traders remain unlinked to the tourism industry, highlighting their inability to access these higher-value links and thus confinement at the lower ends of the VC income spectrum (Fishery and Aquaculture Economics and Policy Division 2007). The fact that it is deemed inappropriate or unsuitable for a woman in Zanzibar to be linked to the tourism industry is one explanation for this (Razavi 2009, Fröcklin et al. 2013).

But the appearance of the tourism sector in the SSF market place also has indirect effects on women. Already in 2002, ActionAid reported that fishermen no longer need to use women traders as much as before, since they now have the option of selling directly to the hotel industry (La Cour Madsen 2003). Large-scale economically focused fisheries development has led to an increase in bulk purchases and wholesale trade, the construction of modern landing sites and market complexes, and more standardized formal sales activities in many places (Williams 2001). This type of growth unfortunately has the potential to exclude the Zanzibari home-based traders, which it has already done in other SSF (Williams 2001). The Zanzibar harvest arena is already dominated by men with relatively few or no fisherwomen appearing in any official statistics (DoE Department of the Environment 2009, Fröcklin et al. 2013, Fröcklin 2014).

As the tourism industry continues to grow and as fishery development focuses on further capacitating male fishers to go more offshore while promoting greater formalized economic actors in fishing and related activities (DoE Department of the Environment 2009, The Revolutionary Government of Zanzibar 2014) this study emphasizes the grave potential for many VC actors, especially female traders, to be vastly overlooked in such development scenarios. These results lead to further questions, such as *whether certain actors, like women, are more negatively affected than others by programs explicitly targeting fisheries development?*



Figure 15: Mashua on the way out to fish for the night, view from Livingstones

4.2 Informal Institutions and Benefit Flows

In recent years as SSF markets change and become more connected to international seafood trade the role of traders has been highlighted (for example Crona et al 2010, Thyresson et al 2011). They play an important role in connecting fishers to market demands and the market place itself, yet they are not include in efforts to manage fisheries more sustainably. These efforts are typically focused on fishing activities i.e. banning gear, restricting fishing areas. While a significant amount is now know about the roles traders play in SSF they are often presented as exploitative in their deals with fishers e.g. trapping them in credit arrangements (Crona et al. 2010, Thyresson et al. 2011, 2013, Ferrol-Schulte et al. 2014, Jentoft & Chuenpagdee 2015, Bailey et al. 2016). This research tries to understand how exactly these deals affect how both fishers and traders benefit from SSF trade.

The analysis shows that fishers with these types of deals or sales arrangements earn less than those who are selling ad-hoc via auctions or more on-the-spot transactions. This supports the evidence from numerous SSF studies where buyers have been observed to influence fishers to accept lower prices as a result of unequal bargaining power and/or indebtedness (Platteau & Abraham 1987, Johnson 2010, Nurdin & Grydehøj 2014).

While the quantitative analysis shows less economic return from trade to actors selling through prearranged deals, these actors are able to access a range of other benefits associated with the arrangements. Not only do fishers receive cash gifts, fuel, bait and other such help from traders but traders too are provided with fish for home consumption, money and the option to pay later from fishers. This shows the importance of these non-sales related social connections for maintaining both local food security, but also for providing the economic margins on which small-

scale traders with limited cash-flow and storage capacities can operate. Similarly to (Klausen 1964, Stirrat 1974, Platteau et al. 1981) in (Platteau 1989) who saw that relationships between fishers and traders in Sri Lanka and Southern India, were more than often founded on residency, kinship, caste and custom, and tended to be rather symbiotic, the fisher-trader relations in Unguja appear to be far more deeply rooted than economic transactions and credit provisions. Isolating such arrangements is not realistic.

A common argument encountered in the SSF literature, and even by progressive sustainability focused movements such as Fair Trade (Bailey et al. 2016), is that traders are largely responsible for fisher's poverty and the poor performance of development services like cooperatives (Ruddle 2011). But such conclusions may signal researchers' or managers' limited ability to understand the complexity of the traders' role and relationships in fisheries.

This research emphasizes embeddedness of the fisher-trader link of the market within a broader network of social relations. In doing so it became apparent that traders on Unguja generally perceive themselves to be more constrained in their trading by their social ties than fishers. Additionally, results highlight the fact that both fishers and traders generally cite social constraints (such as misunderstandings and awkwardness) as a key constraining factor underlying predetermined selling arrangements with consumers. This brings to attention the fact that the fisher-trader link is not always a simple two-way connection but involves influence even from the community scale, echoing the results from (Platteau & Abraham 1987) where social compulsion is readily used in credit arrangements so fishers (debtors) payback traders and don't 'lose face' in the eyes of community members.

We believe this research helps to show that moves to address sustainable fisheries will need to account for the hitherto largely unexplored informal exchange networks in which fish trade is embedded (Coulthard et al. 2011). Attempts to improve fishers' livelihoods should therefore take account of the wider social and economic functions that these relationships play, and analyze existing and new proposed alternatives (for e.g. cooperatives) with an eye to how this will affect the long-term flexibility, adaptability and ultimately ecological impacts of small-scale fisheries actors.

Are more formal capitalized market systems, reliant on fewer larger trading operations, flexible enough to provide actors with safety nets when something unexpected happens?

4.3 Income disparity & distribution

Remarkably few studies exist, in which to situate our current findings on income equality and the distributional characteristics within SSF in Unguja. One Kenyan example (Wamukota et al. 2014) witnessed a relatively high Gini (0.63) in the Kenyan octopus fishery and attributed this to the small number of agents controlling the procurement and marketing of octopus on behalf of local processing plants, whom often provide fishers with gear and employment directly on their behalf. We see the same level of inequality in urban locations in Unguja, urban and rural areas corresponding to kinds of markets in Unguja. Urban Stone Town represents the central market for the entire island, both for seafood and other produce, and a large number of trading actors are present in this setting, ranging from small-scale traders stationed on the streets supplying locals to large retailers (quantity) with rented spaces in the very central fish market supplying high-end markets (e.g. tourism industry, which has been seen as a proxy for international export markets (Thyresson et al. 2013). This diversity may explain the high income inequality amongst urban traders.

Similar to this study's findings, Wamukota et al (2015) also note that the international tourism industry is not having a significant influence on economic benefit. These type of local-scale findings are interesting for the current debate around poverty and integrating SSF into global seafood markets (Béné, Lawton, et al. 2010). Neoclassical economic theory suggests global market integration as a strategy to reduce poverty. However in the fisheries of Kenya and Zanzibar, these economically affluent hotels/resorts do not appear to significantly increase seafood prices or net incomes among the upstream value chain actors (production and small-scale traders). *These types of income results call attention to the need for the fisheries-poverty-trade debate to incorporate more case-orientated examples of benefit distribution on the ground.*

Other data collected by STEP (Seafood Trade, Ecosystems and People)

The study reported on here is part of a larger project aiming to uncover the role of seafood markets and market actors, like traders, in mediating interactions between the social and ecological components in local Small-Scale Fisheries systems.

Additional data also collected by the project includes:

<ul style="list-style-type: none">* Actor ambitions to change value chain positions or activities* Investment costs* Running Costs* Material Style of Life* Landings* Details on gears and vessels (sizes, uses, ownership)	<ul style="list-style-type: none">* Quantities sold or consumed* Fishing Effort information* Processing Activities* Pricing* Sales paths* Decisions around purchases, sales and prices* Household income sources
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