**SUPPLEMENTARY MATERIAL**

**Study Population: Demographics, Economics, Ecology**

The Shodagor are distinct from land-dwelling, village Bangladeshis (who the Shodagor call *grihosto*) in a number of ways, including cultural aspects like religion, political organization, subsistence strategies, and kinship structure (see Novak 1993 for a detailed description of village Bangladeshi culture). The Shodagor speak a distinct dialect of Bengali as well as a Shodagor-specific language. They are Muslim but are often described by other Bangladeshis as “Muslim in name only” because of their religious observances and ceremonies that more-closely resemble ancient Hindu traditions than Muslim practices. Shodagor also have an animist belief system, recognizing and worshiping the major rivers of the region during semi-annual ceremonies.

Marriage is primarily monogamous with mild levels of polygyny. Divorce occurs, but usually early in a marriage before the birth of the first child. The primary reason for dissolution of marriage is death of a spouse. Marriage payments among the Shodagor have recently begun to shift from a primarily brideprice system towards dowry, a shift that village Bangladeshis underwent approximately 50 years ago (Amin & Cain 1997). Kinship is recognized bilaterally: inheritance of identity is traced through the father, while property is inherited from mother and father. As is common among nomadic and semi-nomadic groups (Ember 1975), Shodagor post-marital residence patterns are multilocal. My data show that almost half (49%) of ever-married individuals in Matlab lived patrilocally after marriage, while 21% lived matrilocally, 16% lived bilocally (near both husband’s and wife’s family), and 14% lived neolocally. While there are always exceptions to the rule, village Bangladeshis, in contrast, have strong and long-standing patrilineal, patrilocal traditions (Aziz 1979).

*Group Demographics*

Traditionally, all Shodagor were semi-nomadic, moving 2-3 times per year to different locations throughout Bangladesh. Now approximately half of all families in Matlab move an average of 2 times each year – some moving throughout the country and some moving between *bohor* (distinct groups or clusters of boats) in Matlab. Other families in Matlab move very infrequently or not at all. When not moving between locations, families always situate their houseboats within preexisting bohor – houseboats never reside permanently outside of a bohor. Smaller boats are used as the primary mode of transportation for fishing and for traveling between the houseboat and the land. Families indicate choosing to live in particular bohor for a number of reasons including to be close to relatives, for work opportunities, and because older generations lived in the same bohor.

Among the 5 Shodagor bohor in Matlab, size ranges from 8 to 18 households with an average size of 15 households. The largest bohor included in this study is made up of 32 Shodagor families who have moved onto the land within the last 5 years and live in makeshift houses on very small pieces of land. These families are heavily integrated with those living on boats through kin and cultural ties. There are other Shodagor families living in Matlab who have lived in houses that are similar to land-dwelling Bangladeshis’ for 10 or more years who were not included in this study.

Shodagor political organization is largely status egalitarian, though each bohor has a recognized *shordar* (headman). Shordars obtain their position either through primogeniture, with the oldest son inheriting leadership status from his father, or if either (a) there is no older son or eligible relative of the previous shordar available or (b) a new bohor is formed, through an election held among the other shordars. It is agreed upon by most Shodagor that families who live in houses have slightly higher status than those who live on boats and that those who have lived in houses the longest have the highest status within the community. The Shodagor are also relatively gender egalitarian with women in many families playing a role in decision-making within the family and within Shodagor society and most women moving freely in public and private spaces. The autonomy of Shodagor women is strikingly different from that of village women, for whom purdah is a common practice, women’s sexual reputations are closely guarded, and work outside the home is uncommon (Amin 1997).

Shodagor boys and girls live at home with their parents in nuclear family households throughout childhood and until they get married. Based on data collected by the author (using methods that will be described later), for Shodagor men, first marriage occurs at the age of 23 years, on average, while women marry at the age of 16.5 years on average. Men marry an average of 1.4 times in their lives and women marry an average of 1.14 times in their lives. After marriage, the new couple moves into their own boat, which they often pay for themselves, and form a new household. Men average 24.7 years of age when their first child is born and women average 17.8 years of age at first birth. Women who have likely completed fertility (those 45 years or older) have an average of 5.7 children, however, preliminary analyses of birth spacing data suggest that total fertility for women in more recent generations will be lower.

*Economics*

Shodagor fisher-traders engage in a mixed subsistence and cash economy: people who catch fish sell their catch in the markets in exchange for cash, and traders sell their goods for cash. However, in 2014, 89% of Shodagor families in Matlab reported eating some of the fish they caught on a regular basis. Men primarily work as fishermen with 90% of the men in Matlab fishing for at least some portion of the year in 2014. Some men also engage in day labor (11%), selling household goods (7%), and other types of work (2%) throughout the year, with 18% of men reporting more than one occupation. Almost half (44%) of Shodagor women work at least half of the year as traders, selling goods in markets and door-to-door in villages. Some women also fish with their husbands (31%) for all or part of the year and others are primarily housewives (34%) for at least a portion of the year. These economic roles differ dramatically from those of the landed Bangladeshis, with men heavily engaged in agriculture and wage labor and women rarely working outside of the home (Amin 1998).

*Women’s Occupations: Trading*

Trading is a physically challenging economic task: women walk miles each day with a heavy basket full of household goods carried on their heads. During the dry season (October through March) traders work long days, often beginning work before 7am and not returning home until after 7pm, for 6-7 days per week. They leave their homes, walk to the shops of middlemen in the market where they load up their basket with the goods they plan to sell that day (often melamine products like plates and bowls, cooking pots and utensils, jewelry, or clothing), and then travel in small groups by rickshaw or CNG (small, 3-wheeled compressed natural gas-powered vehicles) to villages throughout Matlab. There, they separate and walk from door-to-door, selling goods to non-Shodagor, Bangladeshi women. At the end of the day, women travel back to Matlab, to the middleman’s shop, where they drop off the basket and unsold goods, settle their accounts, then return home. Some women also trade occasionally during the rainy season because, as one woman reported, it is difficult for households in remote villages to visit the markets, so they are more willing to purchase goods from the Shodagor women.

Trading is a risky occupation in multiple ways: physically, reputationally, and economically. Travel by CNG can result in accidents that cause major injury or are life-threatening. As of 2014, 3 Shodagor women in Matlab had been involved in accidents that required major operations and/or long hospital stays. Women traveling away from home are also at risk of various types of harassment or assault by men on the streets or in villages. Shodagor women attempt to prevent this risk to physical and reputational safety by traveling in groups and interacting primarily with other women. Finally, trading poses economic risk because women may not sell any of their goods on a particular day, having incurred the costs of travel but not earned any money. Also, if any goods are lost, stolen, or sold for a deficit, women may lose additional money. Trading also results in the occasional bonanza, for example, if a woman sells her entire basket of goods.

*Women’s Occupations: Fishing*

Women who fish almost always work with their husbands, and often with children as well. Fishing is also a day-long activity, starting very early in the morning until just before sunset. There are three main types of fishing technology used by Shodagor fishers: a *teta* (a 6-pronged spear tied to the end of a bamboo pole), *borshi* (hundreds or thousands of pieces of thinner fishing line with hooks on the bottom of each, tied horizontally across the width of a thicker line which is strung out across several yards of the river or canal), and fishing nets. When fishing with *borshi,* people typically leave home in their fishing boats by 6am to catch worms and small fish that will be used to bait each hook. They then row their boats to a particular location on the river where they will lay out the line. They wait for some amount of time before pulling up the line, removing any fish from hooks, rebaiting those hooks, and then repeating the entire process. A similar process is used to fish with nets. When fishing with *teta*, fishers seek spots in canals where the water level is low and aim to spear larger fish as they swim by. Each adult and older child has their own spear and they spear the water repeatedly until they catch a fish. At the end of the day, fishing boats return home where adults sort the fish. Men take them to the market to sell for cash while women clean the fishing boat and prepare it for the next day.

Both *borshi* and fishing nets require at least two people on the boat in order to fish with maximum efficiency. One person rows the boat while the other very quickly lays down or pulls up the line or net and removes any fish or other items caught. Families report that when husbands and wives fish together, they share these responsibilities. When they have children on the boat, mother and father also report sharing parenting duties. However, women often have additional responsibilities on the boat, such as cooking or breastfeeding infants.

*Women’s Occupations: Housewife*

Housewives perform duties such as cooking, cleaning, and watching young children (though most women who are not housewives also cook and clean). They do not work outside of the home and typically do not earn any income. Shodagor women work as housewives under a few different circumstances. For most women, this is a temporary state after giving birth, though the amount of time a woman waits before returning to work varies based on her occupation and the season of birth. Other women become a housewife upon marriage. Some Shodagor families consider it “low-status” if a daughter or daughter-in-law works outside the home – either because the majority of non-Shodagor Bangladeshi women (who are considered higher-status than Shodagor families) do not work outside the home or because of the risk to physical safety and reputation that comes with trading – therefore, when arranging a marriage, the groom’s family may agree that their new daughter-in-law will be a housewife. For some women, this only continues until a year or two after the birth of her first child, at which point she will begin fishing or trading. For other women, this is a permanent arrangement. This is more likely if her husband is earning enough money to support the family on his own. Occasionally, a woman will also be a housewife during the time when her children are old enough to fish with her husband but have not yet married and left home.

Many traders spend part of their year working as housewives. When they have young children, these women trade during the dry season but stay home as primary caregiver of children during the rainy season (Starkweather, 2017). When children are old enough to need no or only minimal supervision, these women will either fish with their husbands during the rainy season or will go trading when the weather permits.

*Bangladeshi Ecology*

The ecology of Bangladesh plays an important role in Shodagor lifestyle. Every year, for approximately half of the year, large portions of the entire country of Bangladesh are covered in water, as a result of monsoon rains and Himalayan snowmelt (Hofer & Messerli 1997). The Shodagor refer to this half of the year, which typically begins in June, as the “rainy season.” During June, July, and August, monsoon rains come regularly, but for the Shodagor, the season usually extends through the end of October when the waters have receded to the point that roads are dry and accessible. The other months of the year are referred to as the “dry season,” when water levels of the country’s rivers and canals decrease and land is visible in places that previously were completely submerged.

While the actual living conditions of most Shodagor do not change drastically between the seasons (they continue to live on boats on the water all year), what does change are the economic opportunities. During the dry season, fishing prospects vary across Bangladesh, but as water levels rise, fish become abundant throughout the country, with the availability of larger amounts and different types of fish making fishing a particularly profitable venture. During this half of the year, nearly all Shodagor men and some women fish every day. Selling goods is nearly impossible and highly unprofitable for women during the rainy season because many of the roads in the rural parts of the country are submerged in water. This makes transportation and access to potential customers very difficult. The dry season brings access to roads, making it a profitable time for women to sell goods.

*Local Ecology*

There are also two aspects of the specific ecology of Matlab that are important for Shodagor. First, the distance a family lives from a market town will determine the ease with which women can obtain goods to sell. Women do not store the goods they sell in their own homes, but instead they are held by a *mahajan* (middleman) in a shop in the nearest major market. Each selling day, women travel first to the market to collect their basket of goods, then out to the countryside to sell. Before returning home, women deposit their goods in the shop for the night and settle accounts with the mahajan. There are two major market towns in Matlab and two of the five bohor are located within a 5 or 10-minute walk from those towns, while the other three bohor are located an hour or more away. Distance to market is less important for the success of men’s fishing. Men do sell most of their fish in markets at the end of each day, but this can be done at major and minor markets. Minor markets are located all over the countryside and all 5 bohor in Matlab live within walking distance of a minor market.

The second aspect of the Matlab ecology that is relevant to the Shodagor is the distance a family lives from the confluence of the Donagoda River and the Meghna River, as this will determine fishing opportunities throughout the year. The Donagoda is the main river that runs from north to south through the middle of Matlab. The Meghna is one of the three largest rivers in Bangladesh. Its average width is approximately 5 kilometers, which is nearly equivalent to the widest point of the Mississippi River, and at its widest point, the Meghna is approximately 6 miles from shore-to-shore during the dry season and even larger during the rainy season. At the mouth of the Donagoda, where it connects with the Meghna, the river is wide and deep and there is an abundance of fish, in both number and variety, year-round. As the Donagoda travels away from the Meghna, especially during the dry season, water levels are lower and numbers and varieties of fish diminish. Shodagor who live closer to the Meghna will have year-round fishing opportunities that are potentially profitable, while those who live farther away will find fishing most profitable during the rainy season and less profitable during the dry season.

Shodagor communities are primarily organized around nuclear family dwellings, with boats or houses rarely large enough for extended families. Resources and childcare also tend to be concentrated within the nuclear family, with resources pooled at the household level and little sharing of food or cash between households. Mothers and fathers are responsible for the majority of care for children under the age of 5 (Starkweather, 2017), with teenage siblings also occasionally acting as primary caregivers. Additionally, most households spend at least part of the year living in the same boat group with extended family members. Thus grandparents, aunts, uncles, and other relatives may also help with childcare (Starkweather & Keith, 2019).

Shodagor fisher-traders engage in a mixed subsistence and cash economy. In 2014, 90% of men in our sample and 39% of women caught fish as their primary occupation, and 40% of women worked as traders. Most of the fish caught are sold for cash in nearby markets, and traders also earn cash, though 80% of fishing households reported regularly eating some of their catch. The remaining Shodagor women work as housewives (21% in 2014) and do not earn income or forage for other resources, while the remaining 10% of men worked in fixed-income jobs, either in local markets or as daily wage laborers.

Shodagor women’s occupations differ both in the level of economic risk associated with resource production and their degree of compatibility with childcare (Starkweather, 2017). Women traders collect items to trade (usually household wares, clothes, or jewelry) from middlemen in major market towns every morning, carry those items on the tops of their heads in large baskets, and travel for hours by foot to sell the items to non-Shodagor women living in villages. The travel and physical labor involved makes trading incompatible with childcare and women report never attempting to take infants or children along. As we will formalize below, trading also produces highly variable returns, with daily earning sometimes resulting in modest profits but also sometimes resulting in deficits (in cases where items are sold for less than their value or when items are lost, stolen, or broken), no earnings, and occasional bonanzas. By contrast, the other two occupations – fishing and housewife – are compatible with childcare (following a usually brief postpartum period, women and their husbands often take infants and children of all ages with them on the boat when they fish) and fishing is associated with predictable, low-variance returns (see Results).

Shodagor fathers are also somewhat unusual from a cross-cultural perspective in that a portion of men in the population report staying home as the primary caregiver for their children for up to 6 months of the year (Starkweather, 2017). In a comparison of time allocation data across subsistence systems, men provide variable amounts of childcare (Marlowe, 2000), with forager fathers providing the greatest amount of care, on average summing to 25-35% of the amount of care given by mothers. Aka fathers are at the high end of the spectrum for foragers, holding or within arm’s reach of infants up to 47% of the day (Hewlett, 1991), though as Page (2019) points out, when fathers are doing less intensive types of childcare, such as watching or simply being in proximity to children, this is not necessarily substitutive for maternal care. Although we do not yet have detailed estimates of Shodagor men’s time allocation, their rate of paternal care among the subset of men who act as primary caregivers is likely to be higher than rates reported from foraging groups.

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**TABLES AND FIGURES**

Table S1. Logistic regression results. Exponentiated mean estimates (OR) and 89% credibility intervals (CI) of likelihood of a woman working as a trader vs. either fisher or housewife.

|  |  |
| --- | --- |
|  | OR (89% CI) |
| Intercept (Trade) | -1.83 (-3.47, -0.26) |
| Distance to Meghna | -1.29 (-2.57, -0.02) |
| Time to Market  | 1.56 (0.37, 2.84) |
| Currently Breastfeeding | -1.06 (-2.15, -0.01) |
| Number of Alloparents | 1.18 (0.35, 2.04) |
| Father Stays Home | 1.26 (0.02, 2.53) |
| Husband’s Coeff of Variation | 0.07 (-1.39, 1.51) |

Figure S1. Bayesian posterior modes and 89% credible intervals summarize 2000 retained coefficient samples, showing the relationship of each predictor variable to the outcome of woman’s occupation (fishing, trading, housewife) on a log-odds scale.



Figure S2. Full posterior distributions of mean income by occupation. Peaks represent the most probable means for each curve.

