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Fishermen's wives

On the cultural origins of violence against women

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Abstract: We study the roots of violence against women, and propose that it partly originates in cultural norms that derive from (a) characteristics of the traditional subsistence problem in different societies, and (b) differences in the sexual division of labor for solving that problem in each society. We construct this hypothesis on economics and anthropology research showing the potential of traditional livelihoods to shape persistent cultural norms at the local level, and arguing that this concept can be extended to explain outcomes at the domestic level. We test our main hypothesis by examining differences in the incidence of domestic violence across areas with different historical livelihoods in modern-day Tanzania, where we observe a large degree of spatial variation in both attitudes and actions of violence against women. Using rich individual survey and high-resolution georeferenced data, we find systematically less violence against women in traditionally sea-fishing areas vis-à-vis traditionally lake-fishing, agricultural, and pastoralist ones. Our results are consistent with anthropological accounts of the idea that women in sea-fishing societies tend to be comparatively more independent in decision-making, and to acquire skills that are complementary to demands in non-agrarian sectors. We interpret this as evidence for direct mechanisms helping to sustain egalitarian gender norms in general, and less violence against women in particular. By exploiting sub-national variation, this research allows us to move beyond studying the socio-economic and institutional determinants of violence against women, and to analyse the formation of specific cultural traits that explain where and why some women tolerate less violence against them.

Keywords: Violence against women, culture, marine resources

JEL classification: O13, O55, Z13

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1 Introduction

Violence against women is a disturbing phenomenon. Victims suffer of stress, injuries, and participate with difficulty in education, labor markets, and social life in general. Besides being unfair, costly, and criminal, this type of violence has ramifications such as the reduced well-being of the affected mothers' children, which most likely help to preserve or extend vicious circles of violence and inequality at different levels.

Yet violence against women is still remarkably widespread around the world. More than one third of women across the world have experienced physical or sexual violence at some point (WHO 2013; Garcia-Moreno et al. 2006), and up to two thirds of women have been reported to be victims of similar types of violence at least once during childhood, adolescence, or adulthood in parts of Africa and Asia (UN 2015).

What are the origins of violence against women? Why do some countries have more egalitarian and respectful attitudes and behavior towards women while others do not? And in particular, why are those attitudes and behaviors sometimes so markedly different across regions *within* the same country? We address these types of questions in an effort to go beyond identifying individual and local socio-economic or institutional correlates of domestic violence against women, and ask whether we can identify specific reasons and conditions that enable women to tolerate less violence against them.

Given the importance of subnational differences, we set our focus on cultural elements. Following Alesina et al. (2013) and Alesina et al. (2016), we take as a starting point the influential hypothesis by Ester Boserup (1970) that differences in gender roles across societies are related to cultural differences arising from different characteristics of historical agricultural practices. We extend that idea based on literature about cultural features of pastoralist, lake-fishing, and sea-fishing societies, in order to derive testable implications based on the comparison of cultural norms across societies with these types of traditional livelihoods.

In our review of that literature, we find a pattern of higher equality and a more important role for women in the household economy of sea-fishing societies, vis-à-vis the role of women in pastoralist, lake-fishing, and agricultural societies. This manifests clearly when we focus on characteristics of the sexual division of labor in sea fishing communities, where households typically allocate an important number of tasks related to the domestic economy to women, and where many of those tasks are also valued in non-agrarian sectors outside the local economy.

These characteristics are well documented in ethnographical accounts and an extensive body of research by marine anthropologists, who describe a broad pattern of egalitarian roles for women and men in sea-fishing societies. For instance, Acheson (1981) and McGoodwin (2001) present surveys of the literature with details of societal characteristics and reasons for that type of egalitarian gender equilibrium in sea-fishing areas related. Among them, for example, are the consequences of men and women spending long periods separated in sea-fishing societies, which creates families and household economies led by independent women and functioning without an adult male for much of the time.

Similar findings have appeared recently in empirical research in economics. For example, Ben Yishay et al. (2017) study the effects of marine ecology on social institutions of inheritance and descent in small-scale societies, and find that higher prevalence of matrilineal inheritance in societies located closer to areas of higher quality marine resources. In the same direction, as part

of a broader empirical study on the impact of marine resources on long-term economic development, Dalgaard et al. (2016) show evidence supporting the idea that gender equality is relatively more prevalent in countries with more abundant marine resources today.

Studies about gender norms in traditional livelihoods outside sea-fishing paint a very different pattern. For example, Alesina et al. (2013) investigate whether traditional agricultural practices have influenced the evolution and persistence of gender norms, and find that descendants of societies that traditionally practiced plough agriculture have lower rates of female participation in workplace, politics, and entrepreneurial activities today, and also greater prevalence of attitudes favoring gender inequality. Focusing on the case of traditionally pastoralist societies, Holden and Mace (2003) study the coevolution of norms of descent and cattle. They observe that rules of matrilineal descent are rare in societies that keep large livestock, and also document that norms of descent tend to change from matrilineal to mixed or patrilineal after the acquisition of cattle, in a comparison of 68 small scale societies in Sub Saharan Africa. Finally, related to different types of fishing, Gneezy et al. (2016) find that people in lake-fishing areas tend to trust, coordinate group actions, and cooperate less than their sea-fishing counterparts, in a study comparing workplace organization and norms of cooperation between lake-fishing and sea-fishing villages in Brazil.

The importance of cultural factors as determinants of broad economic outcomes and inequalities has been shown at different macro levels (Alesina et al. 2013; Nunn 2012; Tabellini 2010). But in regional comparisons, where differences in socio-economic and institutional characteristics are likely to be smaller than in cross-national comparisons, it is likely that local differences in cultural characteristics play a relatively more important role, and also that they are mirrored in differences in outcomes at local and even domestic levels.

Against this background, we hypothesize that sea-fishing regions are less likely to tolerate violence against women within their own societies, in comparison with lake-fishing, pastoralist, or agricultural societies. The basic reason is that sea-fishing societies seem to have been able to sustain a comparatively more egalitarian perception of the relative contribution of men and women to the household economy as a cultural norm, by allocating diverse and relevant activities related to the productive economy of the household to women, vis-à-vis societies with different traditional livelihoods.

As an example, consider the active role of women in maintenance of deep-sea fishing tools and equipment, the processing of fish products for the market, and all the activities related to distribution of the catch, which are typically carried out by women (Acheson 1981; McGoodwin 2001). And in contrast, consider the division of labor in lake-fishing societies, where men typically work independently and are in charge of most of the catching and distribution activities (Gneezy et al. 2016). Or the division of labor in pastoralist societies, where women take care of livestock but do not participate to a large extent in any additional activities (Holden and Mace 2003). Or the role of men in plough- or no-shifting agriculture regions, where they are typically in charge of most of soil preparation and related activities, which in time creates and sustains the cultural norm that the appropriate role for women is for activities only within the house (Alesina et al. 2013).

If perceptions of the relative contribution of men and women to the economy of the household and the actual allocation of diverse economic activities to women have the potential to shape cultural norms across households and societies, they will certainly also have some impact on economic, political, and social dimensions.

We believe that those types of norms may affect the incidence of domestic conflict, and violence against women in particular, for two main reasons. First, a more egalitarian perception of the role of household members may be directly reflected in less inequality within the household, and

thereby reduce the probability of starting conflicts. Second, the allocation of diverse economic activities to women can have direct effects for increasing their capacity to curb violence against them at home. For example, it allows women to become more independent and resourceful, by letting them acquire skills that are complementary to jobs outside the basic subsistence activities of the household, which elevates their shadow wages and thereby their bargaining power in the household.

We test these ideas by analysing differences in individual responses of women about their actual experience and attitudes towards violence against them. We study this in the context of modern Tanzania, a country where violence against women is higher than average in a continental and a global perspective, where the problem is widespread and varies unevenly across regions, and where a large part of the population is still involved in a variety of traditionally pastoralist, agricultural, and fishing activities.¹

Our results uncover robust reduced-form evidence in favor of the idea that women in traditionally sea-fishing regions experience systematically lower violence levels than in pastoralist and agriculturalist societies. We find that sea-fishing regions also exhibit a lower justification of violence against women. In contrast, we find that lake-fishing regions have higher levels of sexual violence, as well as a higher degree of marital control compared to other regions. In some instances we find lower justification of violence against women in agricultural regions, but those results can be attributed the presence of subsistence or more basic agriculture, and in general our results show consistently a lower prevalence of justification of violence in sea fishing areas even in those areas.

Overall, these findings hold for a variety of indicators for the actual degree of incidence of violence and for attitudes towards violence, and are robust to controlling for individual levels of human capital and wealth, indicators of women's agency, partner's characteristics, measures of intergenerational transmission of violence, and differences in regional development (which are all well documented determinants of violence against women).

Taken together, our results support the interpretation that a more egalitarian sexual division of labor helps to reduce the incidence of violence against women, and to reduce the justification of violence against them, because it helps women to attain higher shadow wages outside the local economy of the household, and therefore enables them to sustain more bargaining power within the household. This way, we contribute to the existing literature on the persistence and historical conditions that shape gender norms across societies, including studies of the differences in female labor-force participation, fertility, education, marriage arrangements, competitive attitudes, political engagement, and other forms of differences between genders (see, e.g., Giuliano 2017; BenYishay et al. 2017; Alesina et al. 2013; Alesina et al. 2016; Michalopoulos et al. 2016).

In the remainder of the paper we review the related literature (Section 2); and present a description of the data we use (Section 3), the approach in the empirical analysis (Section 4), our main results and discussion (Sections 5 and 6), and our conclusions (Section 7).

¹ The level of violence against women within Tanzania goes up to 58% for women aged 15-49 in Mara, and between 46 and 50% in Mbeya, Kagera, Singida, Morogoro, and Dodoma, the capital of the country (National Bureau of Statistics and ICF Macro 2010). The figures refer to having experienced violence during the 12 months of 2010.

2 Related literature

2.1 Cultural characteristics of local livelihoods

Our aim in this paper is basically to study the relationship between violence against women and the degree of equality in the sexual division of labor in the household. This relationship, according to different literatures, is likely to emanate from gender roles that reflect cultural adaptations to local economy conditions (Alesina et al. 2013; Alesina et al. 2016; Michalopoulos et al. 2016).

For example, research in psychology argues that ecologies shape culture and that culture influences the development of personalities. Triandis and Suh (2002) explain, for instance, that culture-specific personality traits and values can be traced back to subsistence strategies and that all traditionally practiced types of occupations require certain human adaptations and behaviors.

Recent research provides good examples of this for the case of agriculture. Two examples are Alesina et al. (2013), who show that traditional agricultural practices have influenced the evolution of gender norms and, in particular, that traditional plough agriculture is associated with less egalitarian gender norms (measured by gender-role attitudes and the extent of female participation in the labor markets, politics, and entrepreneurial activities); and Talhelm et al. (2014), who show that growing different crops led to important differences in terms of individualism and collectivism among different cultures in China.²

Agricultural societies are also characterized by relatively more structured family relationships. This contrasts with the characteristics of fishing societies, which show higher degrees of risk tolerance, individualism, and a higher degree of gender equality (Acheson 1981). Sea-fishing societies, for example, display a high level of involvement of women in fish processing and distribution of the catch, and a have variety of activities complementary to the main fishing activities that are typically carried out by women (McGoodwin 2001).

It is important to notice that, just as different types of agriculture create different local characteristics and give rise to different cultural norms, different types of fishing seem to create important cultural differences as well. For example, Gneezy et al. (2016) report that behavior among Brazilian fishermen differs depending on whether fishing takes place in a lake (where fishing is inherently an individual activity), or by the sea (where fishermen typically need to work in groups). Their findings indicate that sea-fishermen tend to trust and cooperate more, and also seem to have an advantage in coordinating group activities when compared to their lake-fishing pairs.

For the case of pastoralist societies, Holden and Mace (2003) show that small societies adopting cattle tend to abandon matrilineal social structures in favor of mixed or patrilineal ones. The main reasons are related to the potential for polygyny, the extent to which resources can be transmitted to sons, and the uncertainty about paternity. Societies that have significant resources (like cattle) that can be transmitted to children, tend to evolve culturally towards inheritance rules that favor sons instead of daughters, given that those types of rules help to reduce uncertainties about paternity that are otherwise more prevalent under matrilineal rules. Because of this, it is more common that societies that have less resources (like agricultural societies without ploughs or large

² In particular, they find that Chinese agriculturalists that produce wheat tend to be more individualistic than those producing rice, basically because rice production requires irrigation and cooperation of members of the community to build canals, whereas wheat is a rain-fed crop which requires less group work with the community.

domesticated animals, or traditional small-scale fishing societies) end up preserving matrilineal rules of inheritance (see BenYishay et al. 2017).

2.1.1 Socio-economic factors as determinants of domestic violence

Socio-economic factors are often cited as determinants of violence against women. For example, the risk of violence against women decreases with higher levels of income and education; and demographic factors such as age, number of living male children, and extended family residence are also inversely associated with risk of domestic violence (Castro et al. 2003; Rao 1997; Tur-Prats 2015).³ A study from India for example shows that husbands use violence to extract more transfers from the wife's family, especially if the wife comes from a wealthy family (Bloch and Rao 2002).

Similarly, women's control over resources or membership in group-based savings and credit programs is associated with significantly lower rates of domestic violence (Koenig et al. 2003).

Changes in unemployment have also shown to affect the incidence of domestic abuse. Andenberg et al. (2016) show that an increase in male unemployment is associated with a lower incidence of intimate partner violence, while an increase in female unemployment tends to increase domestic abuse. Emotional shocks have also been identified as one of the causes of intimate partner violence (Card and Dahl 2011).

Finally, there is also evidence that attitudes towards domestic violence are transmitted over generations: children observing violence between parents are likely to be involved in subsequent marital aggressions (Kalmuss 1984). In this case, social mobility, or the extent to which socio-economic conditions of children are determined by those of their parents, becomes an important part of the mechanism for persistence in gender norms.

2.2 Tanzania

Modern-day Tanzania provides appropriate conditions for examining the consequences of differential types of culture on the prevalence of violence against women, for various reasons. First, Africa has an average prevalence of violence against women that is higher than the global mean (WHO 2013), and Tanzania has a higher level of non-partner sexual violence and sexual abuse during childhood than any other African country (WHO 2005). WHO estimates show that about four out of ten women in Tanzania have experienced physical or sexual violence at least once in their lifetime (WHO 2005). Of those who had ever been injured by a partner, one half reported that they needed health care for an injury at least once (Ellsberg et al. 2008). Part of the reason may be that the prevailing gender norms in the country accept women's subordination and even justify male violence towards women (Laisser et al. 2011).⁴

Tanzania is also a country where a variety of traditional livelihood strategies coexists across its different regions, and where traditional sea-fishing, lake-fishing, agriculture and livestock breeding have historically been, and still are, widely practiced at the household level.

Small-scale artisanal fishery accounts for the majority of marine and inland fish catch in the country. This activity relies mostly on traditional small fishing vessels such as small boats, canoes, and dinghies, and uses different hook and line techniques, as well as basket traps, fence traps, and nets

³ We present an empirical analysis of this type of correlates in Tables 2 and 3 below.

⁴ However, even though women in Tanzania are socialized to tolerate domestic violence, it has become easier in recent years for women to report, get help, and suggest preventive measures against domestic violence (Laisser et al. 2011).

(Jiddawi and Ohman 2002).⁵ Traditional fishing also takes place in communities along lakes, among which the largest include Lakes Victoria, Tanganyika and Nyasa.⁶ Small-scale agriculture is also widespread, and it remains as one of the most important sources of livelihood in rural areas. And finally, the country has also a long history of pastoral livestock breeding as a traditional livelihood for several ethnic groups (Quinn et al. 2003) – livestock husbandry remains as an important activity for about 60 per cent of rural households (Covarrubias et al. 2012).

2.3 Characteristics of fisheries in Tanzania

In a comparison of the characteristics of the different traditional livelihoods described above, fisheries have long been perceived as a male business. However, a closer look reveals a number of accompanying activities that are usually performed by women. For example, women perform unpaid pre- and post-harvesting work, such as mending nets, collecting bait, preparing food for fishers, keeping accounts (Williams 2008), and they probably also outnumber men in the processing and trading of fish (Weeratunge et al. 2010).

In general, in much of Africa, women play an important role in trading fish along with other commodities (Norr and Norr 1992; Overå 1993). Evidence from Ghana shows that women's income is important for supporting the entire fishing industry as they invest in canoes and other gear and give out loans to husbands or other fishers (Walker 2002). In Tanzania, a recent study reports an increase in the number of women entering local fish markets in Zanzibar over the last years (Fröcklin et al. 2013).⁷

3 Data

3.1 Data sources

We rely on data on the incidence and attitudes towards violence against women come from the Tanzanian Demographic and Health Survey (DHS) from 2010. The dataset contains basic demographic information, as well as information about health, reproduction, nutrition, and wealth status of 9,375 respondents living in 6,745 households.⁸

The questions about domestic violence were asked only to married women older than 15, so all estimations in our paper exclude non-married women. After removing missing observations, we remain with a sample of 5,068 female respondents older than 15, which is the data that we use in all our estimations.

⁵ More than 500 species of fish are consumed in Tanzania. Consumption is dominated by reef fish species such as emperors, snappers, sweetlips, parrotfish, surgeonfish and groupers (Jiddawi and Ohman 2002).

⁶ Nile perch, Nile tilapia, African catfish and sardines are the most prevalent freshwater species (Ministry of Livestock Development and Fisheries 2010; FAO 2005).

⁷ This particular increased involvement of women in Zanzibar was probably due to the lack of alternative economic activities, and the need for all family members to contribute to household (Fröcklin et al. 2013).

⁸ One drawback of the dataset is that the categories for respondent occupation often group agriculture and fishing, for example, subsistence agricultural and fishery worker, or fishery workers, hunters and trappers. This has prevented us from providing additional evidence by investigating contemporary relationships between livelihood strategies and violence. Another drawback of the DHS dataset is that it does not contain information about ethnicity or religion, which are considered sensitive issues in Tanzania.

We proxy the extent to which agriculture, livestock-breeding, lake-fishing, and sea-fishing have been traditionally practiced in different regions, with measures that speak to the *potential* to carry out these different activities.⁹ For example, as an estimate of the potential to carry out sea-fishing, we rely on the Bounty of the Sea index constructed by Dalgaard et al. (2016). The index measures the potential abundance of exploitable marine fish resources, and is constructed from data that predicts the global habitat suitability of most marine fish species, based on fish preference profiles of local environmental conditions in terms of sea depth, seawater temperature, salinity, primary production, and ice cover. Based on these environmental parameters, the final data represent the potential presence of 15 selected species with substantial contribution to global fisheries in the 1950s, at a 0.5 by 0.5 decimal degrees of latitude by longitude resolution level. This index ultimately reflects whether a particular fish species *could* be observed in a particular location, not whether that species is *actually* observed in that location. We average the index over a 10 km buffer zone around each coastal Tanzanian district and around the island of Zanzibar.

As a measure of the potential to carry out agriculture, we rely on estimates of the suitability of land for agriculture by Zabel et al. (2014). The suitability indices measure the natural potential of land for agricultural use, at a spatial resolution of 30 arc seconds. Each pixel contains the maximum suitability value for 16 plants¹⁰ in four time periods: 1961-1990, 1981-2010, and projections for 2011-2040 and 2071-2100. We use the agricultural index for the period 1981-2010.¹¹

We proxy for the dependence on lake-fishing with an indicator variable of living in a district next to one of three largest lakes in Tanzania: Lake Victoria, Lake Tanganyika and Lake Nyasa.

As a proxy for the potential to breed different types of livestock, we use a standardized measure of livestock distribution, prepared for comparison of different livestock types and sizes, and reported in the Gridded Livestock of the World Database (Robinson et al. 2014; FAO 2015). This index is expressed in Tropical Livestock Units (TLU), which equal one for cattle with body weight of 250 kg. These TLU values vary by country and species as a function of prevailing production systems, breeds, and feed. They take the values 0.5 or 0.6 (based on the country) for cattle, 0.1 for sheep, 0.1 for goats, and 0.7 for camels. The TLU distribution data at 1 km resolution for Tanzania are from 2008 or 2009, depending on the different species considered.

Finally, since different geographic areas might differ not only in ecological and climatic characteristics, but also in general cultural characteristics, we build indicators to control for the most commonly spoken languages in different Tanzanian regions, relying on data from the World Language Mapping System Database (WLMS version 3.01). This dataset contains polygons for the linguistic homelands of 7,219 ethnic languages spoken in the world. We use the information about the number of languages spoken in a particular district in Tanzania to proxy for ethnicity, which is not revealed in the DHS or other micro-level data sources.

⁹ An alternative proxy for the extent of these traditional livelihood types could be obtained from the Murdock's Ethnographic Atlas (Murdock and White 1969). We do not rely on this source, because it does not permit distinguishing between lake and sea fishing, and the coverage of the country is not complete.

¹⁰ The 16 included plants are: barley, cassava, groundnut, maize, millet, oil palm, potato, rapeseed, rice, rye, sorghum, soy, sugarcane, sunflower, summer and winter wheat. Table A1 in the Appendix shows that the most commonly grown crops in Tanzania are maize, beans, sweet potato and rice, indicating relevance of the agricultural suitability index.

¹¹ All the results carry on with the 1961-1990 values.

3.2 Descriptive statistics

Table 1 shows summary statistics of domestic violence against women in Tanzania in 2010. We use nine indicator variables for violence, which take value one if the spouse has ever pushed, shaken or thrown something at the respondent; slapped; punched with fist or something harmful; kicked or dragged; tried to strangle or burn; physically forced sex when not wanted; physically forced other sexual acts when not wanted; twisted woman's arm or pulled her hair or threatened her with any weapon.

The most common type of violence reported is being slapped by the spouse. This holds for 30 per cent of women from the sample. The variable 'Any violence' combines these categories and takes value one if the respondent has experienced any of these nine types of violence and zero otherwise. The average value of this variable is 0.364, meaning that roughly one third of women in our sample has been subject to some type of violence from her marital partner since the age of 15. This implies that the rate of violence in Tanzania is noticeably higher than the average of 29 per cent reported for 18 African countries in Alesina et al. (2016). The Violence index variable sums all types of violence a woman has ever experienced. The average value in the sample is 0.987, which means that practically all women older than 15 have experienced a certain event of violence in their lifetime.

We also examine justification of violence among surveyed women. We construct five indicator variables that take value one if the respondents replied positively to questions about whether wife beating is justified if a woman goes out without telling the husband; neglects the children; argues with the husband; refuses to have sex with the husband; or burns the food.

Tanzanian women report that neglecting the children is the most commonly justified cause of violence. This holds for 42 per cent of women from the sample and is closely followed by justification of violence in case of arguing with the husband and in case of going out without telling, which affects 40 per cent of the sample. The variable 'Any violence is justified' takes value one if a woman justifies any of these five categories of violence and zero otherwise. The average justification rate is 56 per cent. The 'Violence justification index' is obtained by summing all circumstances under which women consider domestic violence to be acceptable. The average value of this index is 1.42, which is slightly larger than 1.3 reported by Alesina et al. (2016) for a sample of 18 African countries.

The DHS dataset comes with several pre-defined categories of violence, which include: less severe violence, severe violence, any sexual violence, emotional violence and anyone forcing the respondent to perform sexual acts. Each of these variables is created by grouping several indicators. For example, emotional violence is a composite of indicators for spouse ever threatening to harm, spouse ever insulting or making the respondent feel bad and spouse ever humiliating the respondent. In terms of prevalence, less severe violence and emotional violence are most common, affecting 39 per cent and 35 per cent of women, respectively.

Table 1: Summary statistics

		(1)	(2)	(3)	(4)	(5)
		Mean	SD	Min	Max	Obs.
Types of violence	Spouse ever:					
	- pushed, shook or threw something	0.130	0.337	0	1	5,068
	- slapped	0.296	0.457	0	1	5,068
	- punched with fist or something harmful	0.150	0.357	0	1	5,068
	- kicked or dragged	0.102	0.303	0	1	5,068
	- tried to strangle or burn	0.026	0.159	0	1	5,068
	- physically forced sex when not wanted	0.127	0.333	0	1	5,068
	- physically forced other sexual acts when not wanted	0.068	0.252	0	1	5,068
	- twisted her arm or pull her hair	0.052	0.222	0	1	5,068
	- threatened or attacked with any weapon	0.025	0.155	0	1	5,068
	Any violence	0.364	0.481	0	1	5,068
	Violence index	0.978	1.691	0	9	5,068
Violence justification	If wife goes out without telling him	0.403	0.491	0	1	5,025
	If wife neglects the children	0.421	0.494	0	1	5,038
	If wife argues with the husband	0.403	0.490	0	1	5,027
	If wife refuses to have sex with him	0.336	0.472	0	1	5,025
	If wife burns the food	0.191	0.393	0	1	5,046
	Any violence is justified	0.562	0.496	0	1	5,068
	Violence justification index	1.742	1.886	0	5	5,068
Types of violence (grouped)	Experienced any less severe violence	0.390	0.488	0	1	5,068
	Experienced any severe violence	0.141	0.349	0	1	5,068
	Experienced any sexual violence	0.150	0.357	0	1	5,068
	Emotional violence	0.354	0.478	0	1	5,068
	Anyone forced respondent to perform sexual acts	0.013	0.114	0	1	4,001
Husband behavior	Husband jealous if talking with other men	0.666	0.472	0	1	5,068
	Husband accuses her of unfaithfulness	0.315	0.464	0	1	5,068
	Husband does not permit her to meet her girlfriends	0.197	0.398	0	1	5,068
	Husband tries to limit her contact with family	0.171	0.377	0	1	5,068
	Husband insists on knowing where she is	0.486	0.500	0	1	5,068
	Husband does not trust her with money	0.152	0.359	0	1	5,068
Main regressors	Sea-fishing: Bounty of the Sea index (10km)	0.026	0.059	0	0.17	5,068
	Lake-fishing: District by three largest lakes	0.172	0.377	0	1	5,068
	Agriculture: Land suitability 1981-2010	0.542	0.088	0.217	0.77	5,068
	Livestock: Tropical livestock units 2005	34.178	83.350	0.467	770.18	5,068

Table 1 (cont.): Summary statistics

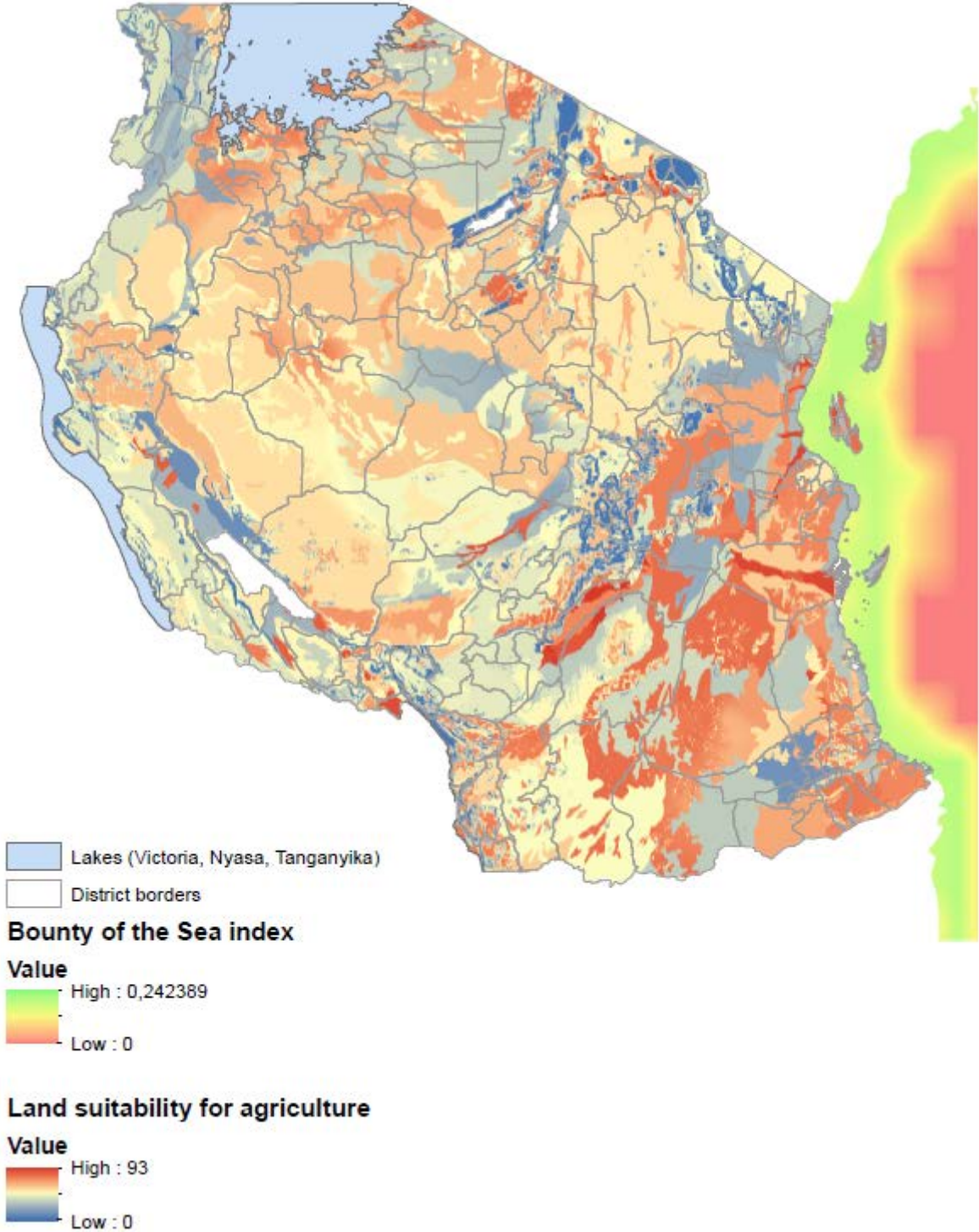
		(1)	(2)	(3)	(4)	(5)
		Mean	SD	Min	Max	Obs.
<i>Control variables</i>	Wealth index	-0.024	0.967	-1.090	3.47	5,068
	No school	0.220	0.414	0	1	5,068
	Primary school	0.710	0.454	0	1	5,068
	Secondary school	0.067	0.250	0	1	5,068
	Higher education	0.003	0.054	0	1	5,068
	Unemployed	0.116	0.321	0	1	5,068
	Employed all year	0.294	0.455	0	1	5,068
	Employed seasonally	0.550	0.498	0	1	5,068
	Employed occasionally	0.040	0.196	0	1	5,068
	Age (woman)	31.473	8.132	15	49	5,068
	Household size	5.557	2.800	1	38	5,068
	Land for agriculture	0.282	1.217	0	9.90	5,068
	Husband has other wives (polygyny)	0.297	0.457	0	1	5,068
	Nearest health center distance (km)	3.409	4.277	0	51	5,068
	Nearest market distance (km)	22.296	22.942	0	94	5,068
	Not owning any land	0.754	0.431	0	1	5,068
	Rents land	0.144	0.351	0	1	5,068
	Sharecropped land	0.017	0.128	0	1	5,068
	Private land provided free	0.055	0.228	0	1	5,068
	Open access/communal land	0.031	0.172	0	1	5,068
	Married	0.791	0.407	0	1	5,068
	Living together	0.070	0.256	0	1	5,068
	Widowed	0.037	0.190	0	1	5,068
	Divorced	0.065	0.247	0	1	5,068
	Separated	0.037	0.188	0	1	5,068
	Rural	0.744	0.436	0	1	5,068
	Urban	0.256	0.436	0	1	5,068
	Distance to the sea (km)	289.60	710.06	0.318	4,077	5,068
	Distance to the nearest of the three largest lakes (km)	538.13	486.58	2.063	3,087	5,068

Source: Authors' calculations based on data described in Section 3.1.

We also have several indicators of marital control exercised by husbands that represent one form of domestic violence. Two-thirds of women report their husbands being jealous if they talk with other men and one half of women stated that the husband insists on knowing where she is. One third of women report having experienced accusations of unfaithfulness.

The main regressors we use in our analysis are (a) the Bounty of the Sea index (as a proxy for the degree on which local economies depend on sea-fishing), illustrated in Figure 1, with an average value of 0.026 (close to both the African and the global median levels); (b) the suitability of land for agriculture in the period 1981-2010 (as a proxy for dependence on agriculture), with a mean value 0.542 and illustrated in Figure 1, which indicates moderate suitability for crop production; (c) TLU distribution (as a proxy for dependence on livestock-breeding and pastoralism), with a mean value 34.18, which is substantially higher than the average of 6 for Sub-Saharan Africa; and (d) an indicator variable of living in a district next to one of three largest lakes in Tanzania (as a proxy for dependence on lake-fishing), with a mean value of 17 per cent indicating the proportion of districts with good potential for lake fishing.

Figure 1: Bounty of the Sea index and suitability of land for agriculture in Tanzania



Source: Authors' compilation based on data described in Section 3.1.

We validate the use of our main regressors by verifying that they are correlated with outcomes that we may observe at the individual or household level, and show in Table 2 that our main regressors successfully predict specific indicators of consumption. For example, we see a strong positive correlation, significant at 1 per cent level, between the sea-fishing index and weekly consumption of fish. The same holds for lake fishing. The potential for sea-fishing is, at the same time, negatively correlated with weekly meat consumption, as shown in Panel B. Suitability of land for agriculture

is positively correlated with meat consumption, as shown in columns (3) and (4) in Panel B. Livestock density correlates positively with meat consumption, as shown in Panel.

Table 2: Validation tests – Fish and meat consumption

Panel A: Fish

	(1)	(2)	(3)	(4)
Dep var:	In the past week, on how many days household ate fish			
Sea-fishing	0.339*** (0.00)	0.273*** (0.00)	0.243*** (0.00)	0.248*** (0.00)
Lake-fishing	0.346*** (0.00)	0.329*** (0.00)	0.256*** (0.00)	0.272*** (0.00)
Agriculture	0.017 (0.29)	0.033** (0.04)	0.010 (0.56)	0.007 (0.72)
Livestock	0.059*** (0.00)	0.019 (0.19)	-0.000 (0.98)	-0.000 (0.98)
Region FE	No	No	Yes	Yes
Language FE	No	No	Yes	Yes
Mean dep var	1.771	1.771	1.771	1.738
Observations	6607	6607	6607	5068
Clusters	5913	5913	5913	5068
N controls	4	29	44	44
Adjusted R ²	0.19	0.21	0.28	0.27

Panel B: Meat

	(1)	(2)	(3)	(4)
Dep var:	In the past week, on how many days household ate meat			
Sea-fishing	0.093*** (0.00)	-0.083*** (0.00)	-0.046** (0.04)	-0.031 (0.17)
Lake-fishing	-0.044*** (0.01)	-0.056*** (0.00)	-0.069*** (0.01)	-0.064** (0.01)
Agriculture	-0.019 (0.27)	0.001 (0.94)	0.043** (0.01)	0.056*** (0.00)
Livestock	0.136*** (0.00)	0.031* (0.07)	0.034* (0.05)	0.019 (0.29)
Region FE	No	No	Yes	Yes
Language FE	No	No	Yes	Yes
Mean dep var	0.960	0.960	0.960	0.950
Observations	6607	6607	6607	5068
Clusters	5913	5913	5913	5068
N controls	4	29	44	44
Adjusted R ²	0.03	0.20	0.23	0.23

Notes: OLS regressions (with population weights for households). Dependent variable ranges from 1 to 7. Column (4) shows results for the sample with non-missing observations for domestic violence. Standardized beta coefficients. *p*-values in parentheses. Standard errors clustered at the household level. Control category for land ownership is no land and married for marital status. Standard errors clustered at the household level are in parentheses. Significance levels: * *p*<0.10, ** *p*<0.05, *** *p*<0.01.

Source: Authors' calculations based on data described in Section 3.1.

The key demographic characteristics of the sample include a household wealth index, women's education and employment status, age, marital status, practice of polygyny, household size, size of agricultural land available to the household, type of land ownership, and distance to the nearest health center and market.

A majority of women in the sample have finished primary school (71 per cent). There are 22 per cent of respondents without any school and 7 per cent with secondary school. In the sample, 11 per cent of women are unemployed, and the majority finds only seasonal employment (55 per cent). The average age is 31 years and the average number of household members is 5. Around 80 per cent are currently married. Polygyny appears to be common as one third of the respondents reported their husbands having other wives. Around three-quarters of the respondents do not own any land. While 14 per cent rent the land, around 6 per cent enjoy free access. Around one half of the respondents have access to agricultural land. Averaging at 0.28 ha, the mean plot size is very small. While the respondents travel on average 3 km to reach nearest health center, they travel around 22 km to reach nearest market. Three-quarters of the sample live in rural areas.

In Table 3, we investigate the prevalence of violence among different demographic and socio-economic groups and regions in Tanzania. All types of violence mostly affect women aged 30-39. Sexual violence is equally high among women aged 15-19. Better educated women appear to be more affected by severe violence, which occurs least commonly among women who have finished secondary school. Sexual violence occurs with similar frequency among women in different education categories. As illustrated in Figure 2, female labor force participation and violence go in opposite directions: women with seemingly more stable, year-round employment are less likely to be affected by domestic violence.

Violence is also most frequently reported by women who are separated from their husbands. Polygynous households have lower rates of severe and sexual violence. Any type of violence is less likely to affect the wealthiest households. Less severe and emotional violence most frequently occur in the lowest wealth quintile, while sexual violence mostly affects middle and upper-middle wealth quintiles. Less severe and sexual violence are most common among the sharecroppers, which at the same time experience the lowest incidence of severe and emotional violence.

All types of violence are more widely spread in rural than urban areas. Less severe and emotional violence occur primarily in the Central and the Lake regions, while severe violence mostly affects the Central and Southern Highlands regions. Sexual violence is most prevalent in the Lake and Southern Highlands regions.¹² Zanzibar is the region with the lowest prevalence of violence. Although not causal, the descriptive evidence presented so far indicates that there could be systematic differences in domestic violence that could be attributed to different sources of subsistence.

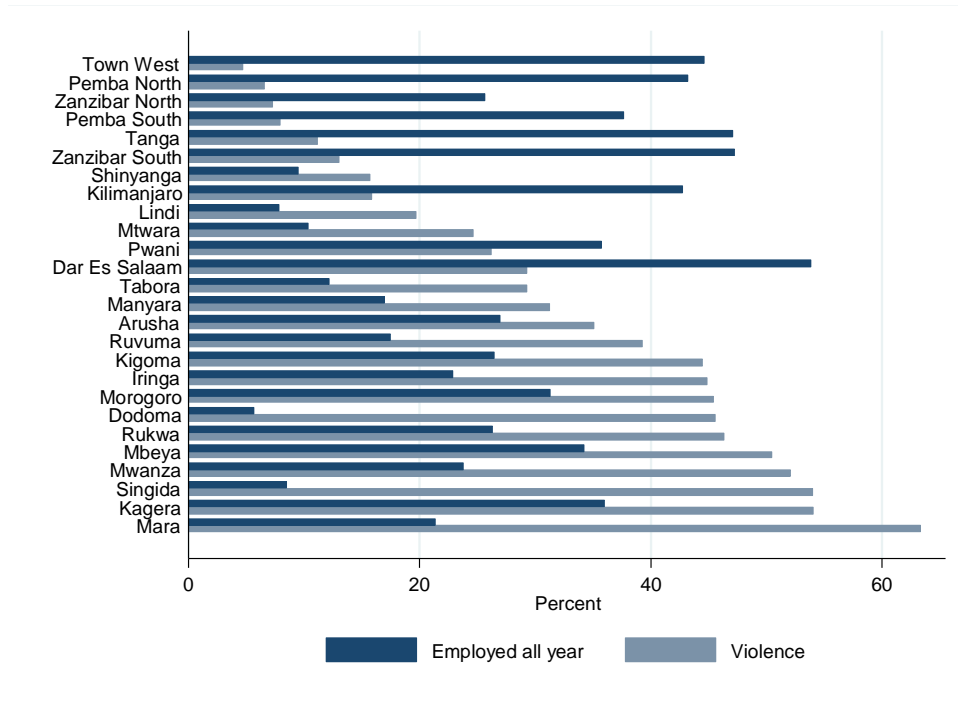
¹² The Central region comprises Dodoma (where the capital is located), Singida and Tabora regions. Southern Highlands comprise Iringa, Mpanda, Mbeya, Njombe, Sumbawanga and Songea regions. Lake region comprises Bariadi, Bujoba, Geita, Kigoma, Musoma, Mwanza (the second largest city in Tanzania located on Lake Victoria) and Shinyanga regions.

Table 3: Cross-tabulations of violence incidence (percentages)

		(1) Less severe violence	(2) Severe violence	(3) Sexual violence	(4) Emotional violence
<i>Age</i>	15-19	30.13	5.25	16.67	24.40
	20-29	39.24	14.76	14.45	35.02
	30-39	40.61	15.35	16.45	37.32
	40-49	37.44	12.78	12.87	35.48
<i>Education level</i>	No school	37.93	14.00	13.79	36.51
	Primary school	40.25	14.56	15.49	36.20
	Secondary school	28.84	9.95	13.21	24.40
	Higher education	47.54	32.46	15.09	32.46
<i>Employment</i>	Unemployed	31.65	10.48	10.09	21.71
	Employed all year	33.26	12.37	15.94	31.57
	Employed seasonally	43.10	15.90	14.97	39.74
	Employed occasionally	45.24	13.73	21.90	44.75
<i>Marital status</i>	Married	36.35	11.55	13.64	32.64
	Living together	35.07	15.34	13.73	33.41
	Widowed	38.71	9.44	8.28	32.77
	Divorced	57.34	31.55	25.60	58.58
	Separated	70.50	41.94	33.79	61.63
<i>Husband</i>	Has other wives	48.27	20.90	18.54	44.65
<i>Wealth quintile</i>	Lowest	42.47	15.93	15.35	40.65
	Second	37.80	15.89	15.12	36.29
	Middle	40.94	14.60	14.94	36.57
	Fourth	40.98	14.76	18.61	35.49
	Highest	31.61	8.97	10.31	27.06
<i>Land ownership</i>	Not owning any land	14.47	14.78	35.35	35.60
	Rents land	13.11	15.10	36.24	36.25
	Sharecropped land	5.70	23.39	26.33	26.16
	Private land provided free	15.43	14.81	32.61	31.60
	Open access/communal land	13.34	14.61	44.04	44.07
<i>Area</i>	Rural	39.81	14.73	15.41	36.76
	Urban	36.50	12.45	13.65	31.61
<i>Region</i>	Central	61.24	20.34	11.59	66.91
	Eastern	36.93	13.70	13.03	26.32
	Lake	52.18	17.37	25.22	51.42
	Northern	23.55	8.46	8.31	17.49
	Southern	32.38	11.86	11.95	23.65
	Southern Highlands	46.57	19.74	22.86	46.36
	Western	32.48	12.08	11.71	30.42
	Zanzibar	6.40	2.52	2.94	7.77
Observations		5,068	5,068	5,068	5,068

Source: Authors' calculations based on data described in Section 3.1.

Figure 2: Regional rates of employment and violence against women



Source: Authors' compilation based on data described in Section 3.1.

4 Empirical strategy

To address the main questions in the paper, we estimate the following type of regressions:

$$V_{id} = \alpha + \beta F_d + \gamma L_d + \delta A_d + \sigma R_d + \rho X_i + \tau_d + \omega_r + \varepsilon_{id} \quad (1)$$

where V_{id} is a measure of different types domestic violence (as described in Table 1 above), in terms of outcomes or beliefs about domestic violence for woman i in district d .

In the baseline specification, V_{id} represents the violence index obtained by aggregating nine different measures of violence described in Section 3. In the second set of estimations, V_{id} is a dummy variable taking value one if a woman reports having experienced any form of domestic violence. In the third set, V_{id} indicates circumstances under which a woman would justify different types of violence. In the fourth set of estimations, V_{id} indicates different types of violence grouped by severity or nature (e.g. severe, sexual or emotional violence). Finally, in a last set of estimations, we replace the dummy variables for violence with the frequency of violence episodes, that is, if they are occurring sometimes or often.

Our regressions include district level values of sea-fishing potential indicated by F_d . We contrast the impact of coastal to lake fisheries by including a dummy variable that indicates a proximity of districts to one of the three largest lakes. Proximity to one of the three largest lakes is indicated by L_d in Eq. (1). We also investigate the impact of norms developed in relation to agricultural production by introducing the measure of suitability of land for agriculture described in the previous section, which is denoted by A_d . As unique cultural norms could surround livestock production, we account for livestock density, indicated by R_d in Eq. (1).

Given that attitudes and practices of violence towards women are certainly ingrained in other pre-existing, traditional aspects of culture, we acknowledge that our results may not reflect the effect of traditional characteristics of the local economy on individual attitudes and acts of violence against women. For instance, it could well be the case that individuals and societies with an initially more unequal and violent set of attitudes against women may have actually shaped the characteristics of the local economy to allow for more violence against women (for instance by choosing technologies that tended to relegate women to low participation outside the household). If that is the case, it would not be the characteristics of the local economy that shape attitudes towards women (as we hypothesize in this paper), but instead that other, pre-existing (not identified) cultural characteristics are in fact the ones that determine individual attitudes towards women.

To reduce the concern about this potential type of endogeneity, we rely on estimates or proxies of the *potential* to sustain agricultural, pastoralist, lake-fishing, or sea-fishing practices in different regions, instead of relying on measures of the *actual* extent to which agriculture, pastoralism, lake-fishing, or sea-fishing are practiced in a given area. If the *actual* capacity to sustain agriculture, breed livestock, or fish in lakes and the ocean is determined by the potential of doing that (which in practice is determined by ecological, geographical and climate conditions that are unlikely to be affected by pre-existing cultural characteristics), then the correlations we report in this paper between the potential characteristics of the local economy, and attitudes and practices towards women, can be interpreted as the reduced form of the causal effect of the traditional characteristics of the local economy on attitudes and practices of violence against women.¹³

X_d comprises respondent and household characteristics: education, employment, age, age squared, household size, agricultural land size, land ownership category, marital status, a dummy for spouse having other wives, distance to the nearest market and health center, a dummy for living in urban area, distance to the sea shore and the nearest lake.

All our main regressions also include a full set of language and survey region fixed effects, denoted by τ_d and ω_r , respectively, which substantially ameliorate concerns about the role of idiosyncratic cultural and institutional regional differences driving the results (for instance, these controls account for the presence of different predominant religions or different ethnicities in different regions of the country). The regions in our set of fixed effects represent: Zanzibar, and the Central, Eastern, Lake, Northern, Southern, Southern Highlands, Western regions. In all our regressions, we cluster the standard errors at the household level.

All regressions are estimated using ordinary least squares. In estimations that use dummy variables for different types of violence, we also report bivariate probit regressions (see Table A3 in the Appendix).¹⁴

¹³ Based on a large literature where this identification approach is applied, we believe that this is the case. See for instance Alesina et al (2013), Donaldson and Keniston (2016), and Dalgaard et al (2016), for recent, related applications of this approach.

¹⁴ We report selected results from probit estimations. All results are available upon request.

5 Results

Our main results show a negative correlation between the potential of sea-fishing and several indicators of prevalence of violence and justification of violence. In the tables below, we report that this result holds across a large number of different specifications.

Column (1) in Table 4 shows that a one standard deviation increase in the potential for sea-fishing reduces the violence index by 0.129 standard deviations. To investigate the difference between coastal and lake fisheries, we control for household location near one of the three largest lakes in column (2) and see that the size of coefficient for the sea-fishing index drops to 0.113 but stays significant. The coefficient for lake proximity is, in contrast, positively correlated with violence, in line with the descriptive evidence presented in Table 3. Controlling for suitability of land for agriculture in column (3) and livestock density in column (4) does not change the size of the sea-fishing coefficient. Accounting for household characteristics in column (5) gives a slightly lower sea-fishing coefficient (0.105), while introducing regional and language fixed effects leads to the coefficient of 0.103, as shown in column (6), which indicates that we control for relevant characteristics and potential confounders of the effect, but which in any case do not reduce the statistical or economic significance of our main hypothesis. Finally, we add controls for distance to the coast and the nearest lake in column (7). While distance to the lake positively predicts individual household violence, the moderating effect from sea-fishing on violence is still present. In that sense, our findings are in contrast from the results in Alesina et al. (2016) showing that violence is higher in societies based upon fishing.

The results in Table 4 also show a negative correlation between agriculture and violence, which is consistent with the characteristics of traditionally agricultural societies in which women contribute to the cultivation by performing activities such as weeding and hoe-preparation of soil.¹⁵ Recent empirical results have also found negative correlation between agriculture and violence. For example, Michalopoulos et al. (2016) show that justification of violence tends to be significantly lower among people from an ethnicity traditionally dependent on agriculture, as compared to people who have descended from traditionally hunter-gatherer populations, in a study of individuals belonging to 492 ethnic groups in 21 African countries.

Our results also show a negative correlation between livestock production and violence, which is in line with arguments presented in Sections 1 and 2, but the effect is not precisely determined.

The coefficients on the control variables show that violence index decreases with household wealth and size, which was also found in earlier studies (see, e.g., Koenig et al. 2003). The inverse-U shape relationship observed for age, indicates that experiencing violence becomes less common later in life, which is in line with the descriptive evidence presented in Table 3. Married women (the omitted category in the set of marital status variables) are more likely to experience violence than widows, while the opposite holds with respect to divorced or separated women. Polygyny correlates positively with violence, and women who live in remote areas seem to be more likely to experience violence.

¹⁵ See for example Baumann (1928), for an account of the division of work according to sex in African hoe cultures. The characteristics of plough agriculture are presented in detail in Alesina et al (2013), and, compared to hoe and shifting agriculture, emphasize cultural norms in which men tend to do a larger fraction of different agricultural tasks, and women tend to do work at home.

Table 4: Violence against women and traditional livelihood

Dep var: Violence index	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sea-fishing	-0.129*** (0.00)	-0.113*** (0.00)	-0.110*** (0.00)	-0.111*** (0.00)	-0.105*** (0.00)	-0.103*** (0.00)	-0.108*** (0.00)
Lake-fishing		0.077*** (0.00)	0.080*** (0.00)	0.079*** (0.00)	0.085*** (0.00)	0.003 (0.93)	0.016 (0.58)
Agriculture			-0.026 (0.12)	-0.024 (0.15)	-0.030* (0.07)	-0.031* (0.08)	-0.022 (0.22)
Livestock				-0.023* (0.07)	-0.021 (0.13)	0.012 (0.41)	0.017 (0.23)
<i>Controls</i>							
Wealth index					-0.060**	-0.057**	-0.058**
Primary school					0.017	0.004	0.001
Secondary school					0.013	0.008	0.009
Higher education					-0.006	-0.007	-0.007
Employed all year					-0.010	-0.056**	-0.056**
Seasonal empl.					0.030	-0.043	-0.043
Occasional empl.					0.014	0.002	0.002
Living together					0.020	0.020	0.021
Widowed					-0.044***	-0.054***	-0.054***
Divorced					0.084***	0.081***	0.081***
Separated					0.095***	0.096***	0.097***
Age					0.576***	0.620***	0.630***
Age squared					-0.591***	-0.627***	-0.638***
Other wives					0.035*	0.043**	0.045**
Household size					-0.036**	-0.030*	-0.030*
Land size (ln)					-0.020	-0.009	-0.009
Rented land					-0.034**	-0.035**	-0.036**
Sharecropped land					-0.003	-0.003	-0.004
Private land					0.011	0.009	0.010
Communal land					0.005	-0.008	-0.007
Urban					0.054**	0.036	0.029
Health center distance (ln)					-0.009	-0.013	-0.011
Market distance (ln)						0.024	0.021
Sea distance (ln)							0.064***
Lake distance (ln)							0.006
Region FE	No	No	No	No	No	Yes	Yes
Language FE	No	No	No	No	No	Yes	Yes
Mean dep var	0.978	0.978	0.978	0.978	0.978	0.978	0.978
Observations	5,068	5,068	5,068	5,068	5,068	5,068	5,068
Clusters	5,068	5,068	5,068	5,068	5,068	5,068	5,068
Control variables	1	2	3	4	27	42	44
Adjusted R ²	0.02	0.02	0.02	0.02	0.06	0.09	0.09

Notes: OLS regressions (with population weights for households). Standardized beta coefficients. *p*-values in parentheses. Standard errors clustered at the household level. Control category for land ownership is no land. Control category for marital status is married. Control category for employment is unemployed. Significance levels: * *p*<0.10, ** *p*<0.05, *** *p*<0.01.

Source: Authors' calculations based on data described in Section 3.1

We also find a negative relationship between sea-fishing and the justification of violence. Column (1) in Table 5 shows that one standard deviation increase in the sea-fishing index leads to about 0.112 standard deviations lower violence of any kind (measured by the ‘Any violence’ dummy). Column (3) shows that one standard deviation increase in the index leads to about 0.05 standard deviations lower justification of any form of domestic violence. Similarly, violence justification index is lower by 0.058 standard deviations with one standard deviation increase in the sea-fishing index. Lake fisheries correlate positively with any violence dummy, as shown in column (1), but not with the violence index, violence justification dummy and the violence justification index. Suitability of land for agriculture correlates negatively with the violence justification dummy and index in columns (3) and (4).¹⁶ In columns (7) and (8), we show that the negative effect from agriculture comes from plough negative crops, consistent with Alesina et al. (2013).¹⁷

Table 5: Different types and attitudes towards violence (as in Alesina et al. 2016)

Dep var:	(1) Any violence	(2) Violence index	(3) Any violence is justified	(4) Violence justification index	(5) Any violence	(6) Violence index	(7) Any violence is justified	(8) Violence justification index
Sea-fishing	-0.112*** (0.00)	-0.108*** (0.00)	-0.050** (0.03)	-0.058*** (0.01)	-0.115*** (0.00)	-0.110*** (0.00)	-0.054** (0.02)	-0.066*** (0.00)
Lake-fishing	0.082*** (0.01)	0.016 (0.58)	0.009 (0.72)	0.001 (0.97)	0.078** (0.01)	0.014 (0.64)	0.009 (0.71)	0.002 (0.94)
Agriculture	-0.007 (0.70)	-0.022 (0.22)	- (0.01)	-0.080*** (0.00)				
Livestock	0.013 (0.42)	0.017 (0.23)	-0.018 (0.31)	-0.014 (0.37)	0.007 (0.65)	0.014 (0.33)	-0.024 (0.17)	-0.026 (0.11)
Plough positive crops					0.028 (0.21)	-0.003 (0.88)	-0.019 (0.41)	-0.022 (0.34)
Plough negative crops					0.007 (0.77)	-0.006 (0.79)	-0.043* (0.06)	-0.075*** (0.00)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Language FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean dep var	0.364	0.978	0.562	1.742	0.364	0.978	0.562	1.742
Observations	5,068	5,068	5,068	5,068	5,068	5,068	5,068	5,068
Clusters	5,068	5,068	5,068	5,068	5,068	5,068	5,068	5,068
Control variables	44	44	44	44	45	45	45	45
Adjusted R ²	0.09	0.09	0.10	0.10	0.10	0.09	0.10	0.10

Notes: Plough positive crops are wheat and rice. Plough negative crops are maize, sorghum, and millet. OLS regressions (with population weights for households). Standardized beta coefficients. *p*-values in parentheses. Standard errors clustered at the household level. Control variables are the same as in column 7 in Table 4. Control category for land ownership is no land. Control category for marital status is married. Control category for employment is unemployed. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations based on data described in Section 3.1

¹⁶ Clustering standard errors at the enumeration area level (440 clusters) confirms these results. results available upon request.

¹⁷ Following Pryor (1985), we classify wheat and rice as plough positive crops and maize, sorghum and millet as plough negative crops.

Table 6 looks at different circumstances under which women find violence justifiable, and shows that areas more suitable for sea-fishing have a reduced probability of women justifying violence. We observe the strongest effect for the most common type of violence motivation in the sample – violence if neglecting the children. Living in lake-fishing and livestock producing areas does not affect attitudes towards violence. Suitability of land for agriculture shows a negative association with most reasons for violence.

Table 6: Women's justification of violence

Wife beating justified if she:	(1) goes out without telling him	(2) neglects the children	(3) argues with him	(4) refuses to have sex with him	(5) burns the food
Sea-fishing	-0.044* (0.06)	-0.062*** (0.01)	-0.045** (0.05)	-0.038* (0.09)	-0.044** (0.04)
Lake-fishing	0.006 (0.85)	0.011 (0.70)	-0.016 (0.58)	0.003 (0.93)	0.023 (0.53)
Agriculture	-0.052*** (0.01)	-0.059*** (0.00)	-0.054*** (0.00)	-0.061*** (0.00)	-0.101*** (0.00)
Livestock	-0.000 (1.00)	-0.012 (0.50)	-0.001 (0.95)	-0.024 (0.10)	-0.024* (0.07)
Controls	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes
Language FE	Yes	Yes	Yes	Yes	Yes
Mean dep var	0.403	0.421	0.403	0.336	0.191
Observations	5,025	5,038	5,027	5,025	5,046
Clusters	5,025	5,038	5,027	5,025	5,046
Control variables	44	44	44	44	44
Adjusted R ²	0.06	0.07	0.06	0.07	0.07

Notes: OLS regressions (with population weights for households). Standardized beta coefficients. *p*-values in parentheses. Standard errors clustered at the household level. Control variables are the same as in column 7 in Table 4. Control category for land ownership is no land. Control category for marital status is married. Control category for employment is unemployed. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations based on data described in Section 3.1.

Table 7 shows correlates of nine different types of violence. In all specifications, higher sea-fishing potential correlates with lower probability of violence. The coefficients are not precisely estimated for the attempts of strangling or burning in column (5) and threatening or attacking with weapon in column (9). One standard deviation increase in sea-fishing potential reduces the probability of violence against women by 0.040-0.105 standard deviations, depending on the dependent variable in case. Lake fisheries correlate positively with sexual violence, as shown in columns (6) and (7), which is in line with the descriptive evidence presented in Table 3. No systematic pattern emerges between agriculture and livestock production and violence.¹⁸

Table 7: Types of violence from husbands

Spouse ever:	(1) pushed, shook or threw something	(2) slapped	(3) punched with fist or something harmful	(4) kicked or dragged	(5) tried to strangle or burn	(6) physically forced sex when not wanted	(7) physically forced other sexual acts when not wanted	(8) twisted her arm or pull her hair	(9) threatened or attacked with knife/gun or other weapon
Sea-fishing	-0.104*** (0.00)	- 0.105** *	-0.091*** (0.00)	-0.056** (0.01)	-0.029 (0.14)	-0.059*** (0.00)	-0.053** (0.02)	-0.040* (0.06)	-0.025 (0.24)
Lake-fishing	-0.037 (0.16)	0.029 (0.33)	-0.007 (0.82)	-0.047* (0.09)	-0.039 (0.26)	0.086** (0.03)	0.094** (0.03)	-0.001 (0.98)	-0.016 (0.49)
Agriculture	-0.008 (0.65)	-0.004 (0.85)	-0.000 (1.00)	-0.026 (0.13)	0.007 (0.74)	-0.030 (0.15)	-0.045** (0.03)	-0.004 (0.85)	-0.024 (0.17)
Livestock	0.020 (0.17)	0.021 (0.20)	0.003 (0.83)	0.031** (0.04)	0.009 (0.64)	0.004 (0.82)	-0.016 (0.23)	0.009 (0.64)	0.011 (0.48)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Language FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean dep var	0.130	0.296	0.150	0.102	0.026	0.127	0.068	0.052	0.025
Observations	5,068	5,068	5,068	5,068	5,068	5,068	5,068	5,068	5,068
Clusters	5,068	5,068	5,068	5,068	5,068	5,068	5,068	5,068	5,068
Control variables	44	44	44	44	44	44	44	44	44
Adjusted R ²	0.05	0.08	0.07	0.05	0.02	0.05	0.04	0.02	0.02

Notes: OLS regressions (with population weights for households). Standardized beta coefficients. *p*-values in parentheses. Standard errors clustered at the household level. Control variables are the same as in column 7 in Table 4. Control category for land ownership is no land. Control category for marital status is married. Control category for employment is unemployed. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations based on data described in Section 3.1.

¹⁸ All these results hold if we replace the indicator of violence with the frequency of violence episodes, that is, if different forms of violence are occurring sometimes or often. The estimation results are shown in Table A1 in the Appendix. The results also hold when we run bivariate probit regressions, as shown in Table A2 in the Appendix.

Table 8 shows correlates of violence severity. Higher sea-fishing potential correlates negatively with less severe, severe and sexual violence in columns (1)-(3). As in Table 7, lake fisheries correlate positively with sexual and less severe violence, while agriculture correlates negatively with severe, sexual and emotional violence. Livestock production correlates positively with severe and emotional violence. Column (5) shows a non-significant negative correlation between sea-fishing and non-domestic sexual acts of violence, which illustrates that the likely mechanism of the impact of sea-fishing potential is through the enactment of cultural norms at the household level.

Table 8: Grouped types of violence

	(1) Experienced any less severe violence	(2) Experienced any severe violence	(3) Experienced any sexual violence	(4) Emotional violence	(5) Anyone forced respondent to perform sexual acts
Sea-fishing	-0.084*** (0.00)	-0.041* (0.05)	-0.045** (0.04)	-0.027 (0.19)	0.004 (0.88)
Lake-fishing	0.052* (0.08)	-0.032 (0.22)	0.093** (0.02)	0.038 (0.22)	0.002 (0.93)
Agriculture	-0.024 (0.20)	-0.041** (0.02)	-0.039* (0.05)	-0.059*** (0.00)	-0.020 (0.50)
Livestock	0.016 (0.33)	0.026* (0.08)	-0.001 (0.96)	0.032** (0.04)	0.019 (0.17)
Controls	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes
Language FE	Yes	Yes	Yes	Yes	Yes
Mean dep var	0.390	0.141	0.150	0.354	0.013
Observations	5,068	5,068	5,068	5,068	4,001
Clusters	5,068	5,068	5,068	5,068	4,001
Control variables	44	44	44	44	44
Adjusted R ²	0.12	0.08	0.06	0.16	0.00

Notes: OLS regressions (with population weights for households). Standardized beta coefficients. *p*-values in parentheses. Standard errors clustered at the household level. Control variables are the same as in column 7 in Table 4. Control category for land ownership is no land. Control category for marital status is married. Control category for employment is unemployed. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations based on data described in Section 3.1.

Domestic violence goes beyond physical and sexual, and also includes acts of husbands' control over women's actions. Table 9 shows the correlates of husband characteristics, which include control of actions and funds, as well as restrictions in freedom of movement. We find that women living in areas with higher abundance of sea resources are less likely to have controlling husbands, that is, those who do not permit their wife to meet her girlfriends or insists on knowing where the wife is. Women living in areas suitable for lake fishing are, in contrast, more likely to have jealous husbands and husbands who insist on knowing where they are at all times. Areas suitable for agriculture show less marital control in terms of socializing, freedom of movement and trust with finances. Living in areas with higher livestock density correlates positively with husband's jealousy.

Taken together, the results reaffirm the idea that women in sea-fishing societies may enjoy more agency than women in lake-fishing areas, which enables them to restrain men's violence against them.

Table 9: Marital control exercised by husbands

Husband:	(1) jealous if talking with other men	(2) accuses her of unfaithfulness	(3) does not permit her to meet her girlfriends	(4) tries to limit her contact with family	(5) insists on knowing where she is	(6) does not trust her with money
Sea-fishing	0.007 (0.75)	0.002 (0.93)	-0.048** (0.05)	0.015 (0.52)	-0.059*** (0.01)	0.005 (0.85)
Lake-fishing	0.049* (0.10)	-0.018 (0.56)	0.004 (0.89)	0.050 (0.14)	0.059** (0.05)	0.049 (0.12)
Agriculture	-0.017 (0.36)	-0.006 (0.75)	-0.035* (0.07)	-0.009 (0.66)	-0.034* (0.07)	-0.043** (0.03)
Livestock	0.035** (0.04)	0.009 (0.62)	0.014 (0.39)	0.013 (0.46)	0.018 (0.32)	0.008 (0.64)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Language FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean dep var	0.666	0.315	0.197	0.171	0.486	0.152
Observations	5,068	5,068	5,068	5,068	5,068	5,068
Clusters	5,068	5,068	5,068	5,068	5,068	5,068
Control variables	44	44	44	44	44	44
Adjusted R ²	0.04	0.05	0.07	0.06	0.09	0.05

Notes: OLS regressions (with population weights for households). Standardized beta coefficients. p -values in parentheses. Standard errors clustered at the household level. Control variables are the same as in column 7 in Table 4. Control category for land ownership is no land. Control category for marital status is married. Control category for employment is unemployed. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations based on data described in Section 3.1.

6 Discussion

An important potential concern in our analysis is that domestic violence could be more strongly influenced by current unobserved socioeconomic status of women, or unobserved status of households, instead of cultural norms related to traditional subsistence types. To assess if current or historical social norms affect violence, we conduct several estimations with indicators for women status and self-determination.

Table A4 in the Appendix shows that the negative correlation between the sea-fishing index and violence is persistent to the inclusion of controls for female fertility, the use of contraception, and husband behavior. Also, the incidence of violence is lower in female headed households.

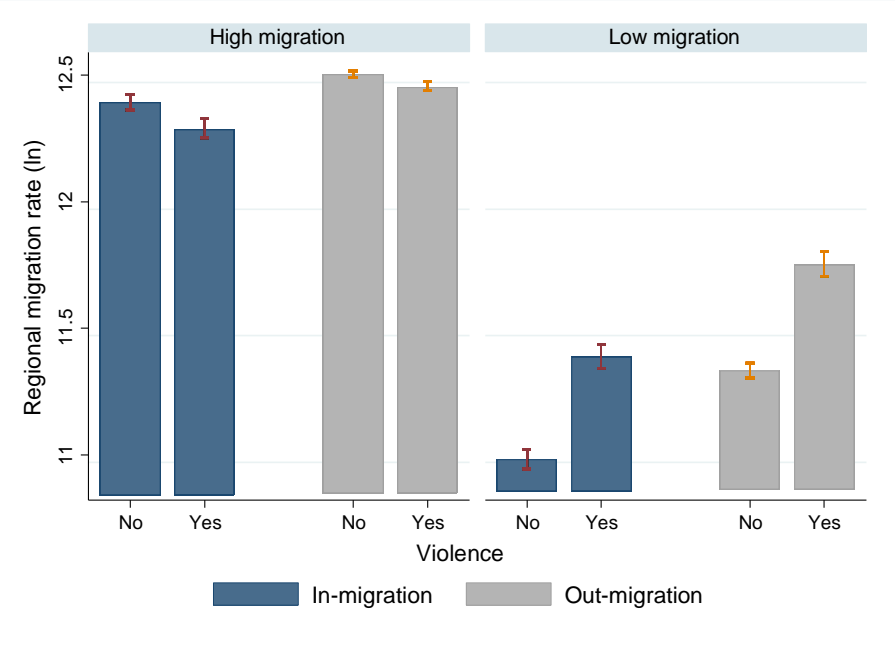
Table A5 in the Appendix shows that the result also persists after including controls for women's participation in decision-making, including decisions about how to spend money the woman has earned, health care and contraception. Table A6 in the Appendix also shows that including a set of controls for husband characteristics, as well as the type of occupation of the respondent and their partner does not affect the significance of the sea-fishing potential variable in the incidence of violence. Among the key husband characteristics, education does not correlate significantly with violence, but the age does, with the same direction as woman's age, indicating a declining rate of violence with age. In terms of occupations, any type of male employment correlates positively with the experience of violence against women, while any type of female employment correlates negatively. This is illustrated in columns (1) and (2). Any form of work correlates negatively with having positive attitudes towards violence, as shown in column (4).

Among other factors that could explain violence in the adulthood, the literature mentions exposure to parental violence while growing up and the influence of the social context in which the person is living (Heise 1998). We control for intergenerational transmission of violence by including a

control variable for the respondent observing that her father has been violent toward her mother. Even though this variable positively predicts incidence of violence against women, it does not affect the significant result for the negative relationship between the sea-fishing index and violence. These results are shown in Table A7.

Tanzania is a country with relatively high levels of internal migration. The latest census data estimate the internal migration rates at 25 per cent. To address the concern that our result may be due to migration of less (more) violent parts of population into coastal (lake) areas, we include regional levels of in- and out-migration in our estimations. Including these variables is useful as a robustness check because we observe different rates of violence in regions with high in- and out-migration. Table A8 shows significantly lower prevalence of violence in regions with lower migration rates than in high migration regions. Furthermore, Figure 3 shows a stronger relationship between migration and violence in the areas of low migration intensity, while it appears equally likely to encounter violence among in- and out-migrants in high-migration areas. As shown in Table A8, controlling for regional migration levels does not change our main result – a significant negative relationship between the potential for sea-fishing and violence.

Figure 3: Regional rates of migration and violence against women



Source: Authors' compilation based on data described in Section 3.1

These checks show that both sea-fishing and agriculture lifeways have a negative effect on violence against women, but it is worth emphasizing that the size of the coefficient for agriculture is smaller than the size of the coefficient for sea fishing, indicating that agriculture areas are still more violent than sea-fishing areas. We substantiate this argument by showing in Table A9 in the Appendix that cultivation of some crops, such as maize, summer wheat and cassava¹⁹ correlates positively with domestic violence. An explanation for the positive correlation in case of these specific crop varieties could be that they are predominantly cultivated as cash crops. In several African countries,

¹⁹ Table A10 in the Appendix shows most commonly grown crops in Tanzania, among which around 40% of households participating in the Agricultural Census produced maize in 2008 and the same proportion of households from the National Panel Sample was also engaged in maize production in 2013.

including Tanzania, cash crops are, due to higher investment requirements, and more commonly cultivated by men than women (World Bank 2015).

7 Conclusion

We integrate research in economics and anthropology to explore the cultural origins of violence against women. We propose that violent attitudes and practices towards women partly originate in differences in the basic subsistence problem across societies, and the characteristics of the sexual division of labor for solving that problem in each society.

To derive our hypothesis, we compare traditional livelihoods' characteristics for sea-fishing, lake-fishing, agriculturalist and pastoralist societies. We argue that traditional sea-fishing societies have a more egalitarian sexual division of labor and a more diversified allocation of activities related to the basic economy of the household, compared to the rest. This is due to the characteristics of sea-fishing economies, which require and therefore enable women to be more independent and resourceful, by allowing them to acquire skills that are complementary to activities in non-agrarian sectors. Because of this, women in sea-fishing areas have probably larger shadow wages outside the traditional economic activity of the household. This may ultimately help to sustain higher degrees of bargaining power for women, and thereby reduce within-household inequalities in general, and to curb the incidence of household violence against them in particular. These described egalitarian conditions seem not to be present to the same extent in traditionally agricultural, pastoralist, and lake-fishing societies, where the norm is closer to having men with a relatively larger and a more visible role within the household's economic activity.

Social organization is an evolutionary outcome of a process of vertical descent in which values and norms arise and are maintained as adaptations to ecological conditions (BenYishay et al. 2017)). Therefore, we believe that it is likely that regions and societies with cultures shaped by values related to a more visible and valuable role for women in the household will also exhibit fewer inequalities within the household in general, and less domestic violence in particular.

We tested that idea with individual survey data and georeferenced data for modern-day Tanzania, where violence against women is widespread unevenly, and a large part of the population is involved in a variety of traditional agricultural and fishing activities.

Our results show that different types of traditional livelihoods are indeed associated with differential incidence of violence against women. Specifically, we find that the characteristics of sea-fishing regions (identified as regions with larger potential abundance of marine fish) are associated with lower violence against women, lower justification of violence against women. Lake-fishing regions show higher levels of sexual and emotional violence, as well as a higher degree of marital control compared to other regions.

Our results point in the same direction for the case of agricultural regions, and show that traditionally agricultural regions are associated with lower justification of violence against women (in line with recent results of Michalopoulos et al. 2016), but also with lower levels of active citizenship. Given that the size of the estimated coefficients for the impact of agriculture are economically smaller than those for sea fishing, we take these results as an indication that sea fishing areas are still relatively less violent than agricultural areas.

We find no systematic or consistently significant relationship between the characteristics of the local economy in livestock-breeding regions and the degree of violence against women in those

areas, except for an indication of a higher rate of emotional violence and higher levels of justification of violence against women.

As we control for household wealth level in all our estimations, our results are not driven by generally better socio-economic status of households located in coastal areas, or in any other region. Our results also account for differential effects related to individual, household, or regional characteristics (such as the level of education and marital status of women, the household size and the type of land property that the household owns, a full set of regional and language fixed effects, which account for differences in cultural, institutional, and historical dimensions across regions). The results are not affected either by controlling for some characteristics of the husband, like age, experience, education and occupation.

Taken together, our results support the idea that a more egalitarian perception of the contribution of men and women to the basic subsistence problem of the household, and a diverse allocation of economic household activities to women, may help to shape and maintain cultural values that, in the end, can be effective to reduce the incidence of violence against them, and to reduce the justification of violence against them.

Socio-economic conditions, geography and culture explain about 10 per cent of the total variation in domestic violence against women in Tanzania. One fifth of this can be attributed to the specific cultural aspects and mechanisms discussed in this paper. Our findings therefore illustrate the importance of considering cultural legacies in the design of policies aimed at prevention of domestic violence in developing countries. At the same time, they can also be useful in the analysis of policy actions in the realm of property rights and intra-household allocation, which affect the perception of equality within the household and may have an indirect but relevant effect on inequalities within the household in general, and on violence against women in particular.

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APPENDIX

Table A1: Most common crops in Tanzania

	(1)		(2)	
	Agricultural Census 2008		National Panel Survey 2013	
	Frequency	Percent	Frequency	Percent
Maize	12,698	38.81	3,079	38.55
Beans	5,694	17.29	871	10.98
Sweet potato	2,716	8.25	364	4.59
Paddy	2,183	6.63	805	10.15
Cowpeas	1,355	4.11	244	3.08
Groundnut	1,191	3.62	472	5.95
N	32,940	78.45	7,934	73.56

Source: Authors' calculations based on Agricultural Census and National Panel Survey.

Table A2: Violence severity

Spouse ever: (severity)	(1) pushed, shook or threw something	(2) slapped	(3) punched with fist or something harmful	(4) kicked or dragged	(5) tried to strangle or burn	(6) physically forced sex when not wanted	(7) physically forced other sexual acts when not wanted	(8) twisted her arm or pull her hair	(9) threatened or attacked with knife/gun or other weapon
Sea-fishing	-0.108*** (0.00)	-0.100*** (0.00)	-0.078*** (0.00)	-0.062*** (0.00)	-0.022 (0.27)	-0.056*** (0.00)	-0.057*** (0.01)	-0.042* (0.06)	0.007 (0.69)
Lake-fishing	-0.049* (0.07)	0.011 (0.68)	-0.020 (0.53)	-0.053** (0.04)	-0.018 (0.63)	0.104** (0.03)	0.091** (0.05)	-0.018 (0.58)	0.021 (0.30)
Agriculture	-0.005 (0.81)	-0.006 (0.74)	0.001 (0.97)	-0.019 (0.27)	0.021 (0.35)	-0.016 (0.48)	-0.030 (0.20)	-0.010 (0.62)	-0.030* (0.08)
Livestock	0.013 (0.38)	0.030* (0.07)	0.016 (0.32)	0.025* (0.08)	-0.002 (0.92)	0.003 (0.86)	-0.015 (0.23)	0.008 (0.65)	0.007 (0.53)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Language FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean dep var	0.169	0.375	0.199	0.137	0.033	0.170	0.085	0.068	0.073
Observations	5054	5048	5054	5054	5061	5058	5052	5056	5056
Clusters	5054	5048	5054	5054	5061	5058	5052	5056	5056
Control variables	44	44	44	44	44	44	44	44	44
Adjusted R ²	0.05	0.09	0.07	0.05	0.02	0.05	0.04	0.02	0.02

Notes: Violence severity comprises three categories: no violence, experiencing violence sometimes and experiencing violence often. Standardized beta coefficients. OLS regressions (with population weights for households). *p*-values in parentheses. Standard errors clustered at the household level. Control variables are the same as in column 7 in Table 4. Control category for land ownership is no land. Control category for marital status is married. Control category for employment is unemployed. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations based on data described in Section 3.1.

Table A3: Probit estimations of violence

Spouse ever:	(1) pushed, shook or threw something	(2) slapped	(3) punched with fist or something harmful	(4) kicked or dragged	(5) tried to strangle or burn	(6) physically forced sex when not wanted	(7) physically forced other sexual acts when not wanted	(8) twisted her arm or pull her hair	(9) threatened or attacked with knife/gun or other weapon
Sea-fishing	-0.634*** (0.000)	-0.802*** (0.000)	-0.681*** (0.000)	-0.386*** (0.001)	-0.196** (0.038)	-0.439*** (0.001)	-0.214** (0.019)	-0.223** (0.013)	-0.223** (0.013)
Lake-fishing	-0.010 (0.622)	0.040 (0.123)	-0.013 (0.522)	-0.022 (0.194)	-0.005 (0.594)	0.032* (0.080)	0.036** (0.011)	-0.010 (0.437)	-0.010 (0.437)
Agriculture	-0.008 (0.890)	-0.040 (0.584)	0.029 (0.634)	-0.066 (0.194)	-0.000 (0.997)	-0.083 (0.108)	-0.108*** (0.003)	0.008 (0.836)	0.008 (0.836)
Livestock	0.000 (0.151)	0.000 (0.243)	-0.000 (0.630)	0.000 (0.314)	0.000 (0.454)	0.000 (0.517)	-0.000 (0.323)	-0.000 (0.992)	-0.000 (0.992)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Language FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,068	5,068	5,068	5,068	5,068	5,068	5,068	5,068	5,068

Notes: Probit partial effects. Unweighted estimates. Standard errors clustered at the household level are in parentheses. Control variables are the same as in column 7 in Table 4. Control category for land ownership is no land. Control category for marital status is married. Control category for employment is unemployed. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Source: Authors' calculations based on data described in Section 3.1.

Table A4: Agency measures, attitudes and incidence of violence

	(1) Any violence	(2) Violence index	(3) Any violence is justified	(4) Violence justified index
Sea-fishing areas	-0.797*** (0.00)	-2.646*** (0.00)	-0.412** (0.03)	-1.813*** (0.01)
<i>Agency:</i>				
Using contraception	0.008 (0.66)	0.089 (0.16)	0.011 (0.55)	-0.012 (0.86)
Total children ever born	0.016*** (0.00)	0.068*** (0.00)	0.008 (0.11)	0.043** (0.02)
Partner drinks alcohol	0.188*** (0.00)	0.684*** (0.00)	-0.000 (1.00)	0.044 (0.50)
Female household head	-0.041 (0.16)	-0.208** (0.05)	-0.041 (0.17)	-0.250** (0.03)
Controls	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
Language FE	Yes	Yes	Yes	Yes
Mean dep var	0.364	0.978	0.562	1.742
Observations	5068	5068	5068	5068
Clusters	5068	5068	5068	5068
Control variables	48	48	48	48
Adjusted R ²	0.13	0.13	0.10	0.10

Notes: OLS regressions (with population weights for households). Standardized beta coefficients. p -values in parentheses. Standard errors clustered at the household level. Control variables are the same as in column 7 in Table 4. Control category for land ownership is no land. Control category for marital status is married. Control category for employment is unemployed. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations based on data described in Section 3.1.

Table A5: Violence and decision making

Type of decision:	Deciding how to spend money woman has earned				Deciding about health care				Deciding about contraception			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dep var:	Any violence	Violence index	Any violence justified	Violence justified index	Any violence	Violence index	Any violence justified	Violence justified index	Any violence	Violence index	Any violence justified	Violence justified index
Sea-fishing areas	-1.008*** (0.00)	-4.147*** (0.00)	-0.785** (0.01)	-2.210** (0.05)	-0.934*** (0.00)	-3.060*** (0.00)	-0.381* (0.07)	-1.836** (0.01)	-0.746** (0.01)	-2.214** (0.04)	-0.265 (0.41)	-1.918* (0.09)
<i>Decision:</i>												
Together	-0.079*** (0.01)	-0.201** (0.04)	0.002 (0.94)	-0.038 (0.72)	-0.117*** (0.00)	-0.511*** (0.00)	-0.033 (0.19)	-0.174* (0.06)	0.034 (0.57)	0.097 (0.64)	0.011 (0.84)	0.182 (0.34)
Husband alone	0.046 (0.29)	-0.036 (0.81)	0.156*** (0.00)	0.683*** (0.00)	-0.067** (0.02)	-0.402*** (0.00)	0.108*** (0.00)	0.436*** (0.00)	-0.047 (0.24)	-0.134 (0.31)	-0.007 (0.86)	0.147 (0.31)
Someone else	-0.263*** (0.00)	-0.685*** (0.00)	-0.391*** (0.00)	-1.142*** (0.00)	-0.108 (0.21)	-0.487** (0.05)	0.151* (0.10)	0.424 (0.32)	0.080 (0.63)	0.683 (0.49)	0.056 (0.74)	0.860 (0.20)
Other					-0.089* (0.09)	-0.339** (0.04)	0.701*** (0.00)	2.109*** (0.00)	0.108 (0.49)	0.749 (0.43)	0.079 (0.63)	0.892 (0.15)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Language FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean dep var	0.317	0.801	0.506	1.523	0.356	0.908	0.563	1.752	0.344	0.917	0.529	1.620
Observations	1,780	1,780	1,780	1,780	4,384	4,384	4,384	4,384	1,435	1,435	1,435	1,435
Clusters	1,780	1,780	1,780	1,780	4,384	4,384	4,384	4,384	1,435	1,435	1,435	1,435
Control var	42	42	42	42	44	44	44	44	44	44	44	44
Adjusted R ²	0.12	0.10	0.14	0.15	0.10	0.09	0.13	0.13	0.06	0.07	0.11	0.11

Notes: OLS regressions (with population weights for households). Baseline decision category is women decides alone. Sample includes women that are married or living together with a partner. Standardized beta coefficients. p -values in parentheses. Standard errors clustered at the household level. Control variables are the same as in column 7 in Table 4. Control category for land ownership is no land. Control category for marital status is married. Control category for employment is unemployed. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations based on data described in Section 3.1.

Table A6: Violence and occupation categories

Dep var:	(1) Any violence	(2) Violence index	(3) Any violence is justified	(4) Violence justified index
Sea-fishing	-0.098*** (0.00)	-0.091*** (0.00)	-0.030 (0.26)	-0.037 (0.13)
Husband's age	-0.220*	-0.375***	-0.079	0.063
Husband's age squared	0.158*	0.308***	0.050	-0.051
<i>Education (wife):</i>				
Primary	0.004	-0.021	-0.014	-0.032
Secondary	0.032	0.016	-0.071***	-0.074***
Higher	0.042***	0.035***	-0.025***	-0.015**
<i>Education (husband):</i>				
Primary	0.042*	0.017	-0.027	0.011
Secondary	-0.019	-0.004	-0.043	-0.004
Higher	-0.036*	-0.029	-0.015	-0.007
<i>Occupation (wife):</i>				
Professional	-0.032	-0.033*	-0.026	-0.033
Clerical	-0.003	-0.005	-0.013	-0.019**
Agricultural employee	0.018	0.020	-0.018	-0.012
Domestic	0.015	0.003	0.025	-0.002
Services	0.016	0.032	-0.045*	-0.062***
Skilled manual	0.024	0.006	-0.031	-0.069***
Unskilled manual	0.039	0.022	0.012	-0.022
<i>Occupation (husband):</i>				
Unemployed	-0.027***	-0.024**	0.017	0.026
Professional	0.004	0.021	0.011	-0.007
Clerical	-0.009	-0.010	0.007	-0.026***
Agricultural employee	0.037	0.015	0.037***	0.034*
Domestic	0.029	0.017	0.031	0.002
Services	0.037*	0.032*	0.008	0.015
Skilled manual	0.038*	0.026	0.005	-0.010
Unskilled manual	0.061***	0.037*	-0.037*	-0.030
Controls	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
Language FE	Yes	Yes	Yes	Yes
Mean dep var	0.363	0.929	0.569	1.769
Observations	3,691	3,691	3,691	3,691
Clusters	3,691	3,691	3,691	3,691
Control variables	63	63	63	63
Adjusted R ²	0.11	0.09	0.11	0.11

Notes: OLS regressions (with population weights for households). Sample includes married women only. Control category for employment is not working. Standardized beta coefficients. p -values in parentheses. Standard errors clustered at the household level. Control variables are the same as in column 7 in Table 4. Control category for land ownership is no land. Control category for marital status is married. Control category for employment is being unemployed. Base category for occupation is self-employment in agriculture. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Source: Authors' calculations based on data described in Section 3.1.

Table A7: Controlling for intergenerational violence

Dep var:	(1) Any violence	(2) Violence index	(3) Any violence is justified	(4) Violence justification index
Sea-fishing	-0.104*** (0.00)	-0.100*** (0.00)	-0.045* (0.05)	-0.051** (0.02)
Lake-fishing	0.083*** (0.01)	0.017 (0.55)	0.010 (0.70)	0.002 (0.94)
Agriculture	-0.004 (0.81)	-0.019 (0.28)	-0.048*** (0.01)	-0.078*** (0.00)
Livestock	0.013 (0.43)	0.017 (0.24)	-0.018 (0.30)	-0.014 (0.37)
Intergenerational violence	0.134*** (0.00)	0.118*** (0.00)	0.072*** (0.00)	0.103*** (0.00)
Controls	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
Language FE	Yes	Yes	Yes	Yes
Mean dep var	0.364	0.978	0.562	1.742
Observations	5,068	5,068	5,068	5,068
Clusters	5,068	5,068	5,068	5,068
Control variables	45	45	45	45
Adjusted R ²	0.11	0.10	0.10	0.11

Notes: The indicator for intergenerational transmission of violence is based on the question 'As far as you know, did your father ever beat your mother?'. OLS regressions (with population weights for households). Standardized beta coefficients. *p*-values in parentheses. Standard errors clustered at the household level. Control variables are the same as in column 7 in Table 4. Control category for land ownership is no land. Control category for marital status is married. Control category for employment is unemployed. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations based on data described in Section 3.1.

Table A8: Regional rates of migration and violence against women

Violence rates in different areas (%)	2002			2012		
	Low	High	t-value	Low	High	t-value
In-migration	30.7	32.9	1.71**	31.3	32.4	0.84
Out-migration	25.9	36.4	8.04***	24.9	37.2	9.41***
Overall migration	25.5	37.0	8.86***	26.7	36.0	7.09***

Notes: Migration data show regional values. Overall migration is the sum of in- and out-migration. Low (high) migration rate is migration level below (above) median. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations based on DHS and National Panel Survey

Table A9: Traditional lifeways and violence after accounting for migration

Dep var: Violence index	(1)	(2)	(3)	(4)
	Low migration (both in and out)	High migration (both in and out)	Low overall movement of people	High overall movement of people
Sea-fishing	-0.044** (0.02)	-0.058 (0.32)	-0.075** (0.03)	-0.051*** (0.00)
Lake-fishing	-0.035 (0.34)	0.063 (0.35)	0.039 (0.37)	-0.013 (0.77)
Agriculture	0.014 (0.58)	0.009 (0.84)	0.011 (0.72)	0.007 (0.78)
Livestock	0.046** (0.03)	0.015 (0.63)	0.010 (0.70)	0.025 (0.21)
Inward migration (In)	0.050* (0.10)	0.264 (0.32)	0.021 (0.43)	-0.013 (0.68)
Outward migration (In)	-0.048* (0.09)	-0.236** (0.01)	-0.592*** (0.00)	-0.121*** (0.00)
Controls	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
Language FE	Yes	Yes	Yes	Yes
Mean dep var	1.090	0.882	0.978	1.018
Observations	3,445	1,426	2,278	2,593
Clusters	3,445	1,426	2,278	2,593
Control variables	45	42	42	44
Adjusted R ²	0.11	0.10	0.10	0.11

Notes: Migration data are from 2002 census and show regional values. OLS regressions (with population weights for households). Standardized beta coefficients. p -values in parentheses. Standard errors clustered at the household level. Control variables are the same as in column 7 in Table 4. Control category for land ownership is no land. Control category for marital status is married. Control category for employment is unemployed. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations based on data described in Section 3.1.