

LAND INHERITANCE AND GENDER:
SOCIAL FACTORS AFFECTING LAND INHERITED
IN RURAL BANGLADESH

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ABSTRACT

This thesis examines what affects whether men and women in rural Bangladesh inherit land and, if they do inherit land, what affects the amount of land inherited. The data is collected from Matlab, Bangladesh, a small-scale agricultural society that has only recently become engaged in industrialization. Land inheritance has traditionally played a key role in a person's social status and economic security, but changes in the amount of land and in demographics have altered the importance of land and who does the inheriting.

Based on a survey of 944 women in rural Bangladesh, this study provides strong support for the predictions that women in Bangladesh are less likely to inherit land and (if they do inherit) to inherit less land than men, that a woman's likelihood of having inherited land increases when her mother has inherited land, that whether a man or a woman works in agriculture increases their chances of having inherited land, that men's chances of having inherited land are increased when their parents own land, that women are significantly more likely to inherit land post-mortem than are men, that the amount of land a woman inherits increases as the amount of land her mother inherited increases, and that the amount of land a man inherits increases as his education increases.

1. Introduction

On the Human Development Index, which measures life expectancy, literacy, education, standards of living, and quality of life for 187 countries around the world, Bangladesh ranks 142nd (Malik, 2014). Its gross domestic product per capita, which measures purchasing power parity and indicates a country's standard of living, was \$2,557, ranking it 150th out of 187 countries (World Bank, 2015). 5.3% of the world's poor live in Bangladesh (UN, 2014). About 40% of the country's population is underemployed, a term used to refer to people who work only a few hours a week at low wages (CIA, 2015). An estimated 45% of the population was underfed in 2010 (USAID, 2010). According to the World Bank (2015), 43.25% of the population was living in poverty (under \$1.25 a day) in 2010.

However, Bangladesh's economy and quality of life are improving. The poverty rate has been decreasing by an average 1% a year since 1988. The poverty rate was 69.55% in 1984, 25% points higher than it was 30 years later in 2010, when the poverty rate was 43.25%. The child malnutrition rate lowered from 63.8% in 1983 to 36.8% in 2011. Maternal mortality lowered from an estimated 322.2 deaths per 100,000 births in 2001 to an estimated 220 deaths per 100,000 births in 2010 (World Bank, 2015).

A large portion of Bangladesh's population is involved in agriculture, although the percentage has been decreasing steadily over the last decade; 62.1% of Bangladesh's population was employed in agriculture in 2000, but only 48.1% were employed in agriculture by 2005 (World Bank, 2015). Despite this decrease, agriculture remains Bangladesh's largest employer. According to the CIA, in 2013, it employed 47% of the

population, while the industrial sector employed 13% and the service sector employed the remaining 40%. Despite being the largest employer, agriculture produced only 17.2% of Bangladesh's GDP in 2013, while the industrial sector produced 28.9% and service produced 53.9% (CIA, 2015). Even though about 80% of poor rural families participate in the agricultural industry, it is not how they earn all of their income. A survey by Birthal et al. (2014) found that impoverished, rural families in South Asia earned almost half of their income from something besides agriculture. Most of Bangladesh's population is rural with 75% of the population of the population living and working in rural areas (Scalise, 2009).

Because of its fertile land, people in Bangladesh are able to harvest their crops multiple times a year. In 2010-2011, 27.7% of the total land area was harvested twice a year, 9.8% of the total land area was harvested thrice a year, and .04% of the total land area was harvested four times in a year (AIS, 2013). Using a system developed by American meteorologists and implemented by non-governmental organizations in 2004, farmers in Bangladesh have improved their ability to predict floods, which has increased agricultural yields and reduced starvation (Mutton & Haque, 2004; Hopson & Webster, 2010; Webster, 2013).

As in many other places, land is usually the most important possession a person in rural Bangladesh can have (Baker & Miceli, 2005; Scalise, 2009; Deininger, Goyal, & Nagarajan, 2010). In 2009-2010, 65% of the total population and 80% of the rural population were dependent at least in part on agriculture. One indication of the importance of land is in the levels of poverty according to land ownership. The country's overall poverty rate was 41% in 2010, but households without any land had a poverty rate

of 80%, households with up to 2,000 m² had a poverty rate of 60%, and households with more than 10,000 m² had a poverty rate close to 0% (Ahmed, 2012). Land ownership is also not distributed evenly, with the poorest 40% of Bangladesh's population owning a mere 2% of the country's land and the wealthiest 5% owning 35% of the land (IFAD, 2014).

Islam (2013) argues that land ownership is decreasing and warned that decreasing agricultural land in Bangladesh will lead to water shortages, decreasing land fertility, lower food productivity, environmental degradation, rising food prices, poor nutrition, and high morbidity. This decrease is important to Bangladeshis, because, traditionally, land ownership was a person's provision against poverty and was the best way for parents to ensure their children's prosperity (Deininger, Goyal, & Nagarajan, 2010). However, as land has been lost to industrialization and environmental degradation, Bangladeshis are reported to own less and less land than previously and to require other sources of support (Scalise, 2009).

Men and women who inherit land are in a more secure economic position than people who do not (Baker & Miceli, 2005; Scalise, 2009; Deininger, Goyal, & Nagarajan, 2010). The Bangladeshi government recognizes the importance of land inheritance and has passed multiple laws to ensure women have the right to inheritance (Agarwal, 1990; Agarwal, 1994). These laws, though, are rarely implemented (Subramanian, 1998; Arens, 2011).

Traditionally, women in Bangladesh did not inherit land, and marriage was used instead to protect women from poverty (Momen, Bhuiya, & Chowdhury, 1995). The divorce rate in Bangladesh, though, has been rising rapidly (Akter & Begum, 2012).

Women who divorce or who are abandoned by their husbands experience economic insecurity and must rely on others in order to survive (Momen, Bhuiya, & Chowdhury, 1995).

It is important to understand what is happening with regards to inheritance, so we can better understand the economic situation rural Bangladeshis live in. This understanding could also be used to benefit the impoverished by determining what factors affect whether a person inherits land and how much land that person inherits, which this thesis attempts to do. By learning these factors, it might be possible to either change Bangladeshis' cultural mindset, so they consider certain factors less important, or to improve a person's ability to change the factors that would improve his/her chances of inheriting land. In addition, much has been made about the decreasing amount of land in Bangladesh (Rahman, 1999; Islam, 2013), and this thesis attempts to determine exactly how much land inheritance has changed in the recent past as industrialization and globalization have increasingly affected the country's economy.

Binary logistic regressions were used to examine what effect a woman's number of siblings, number of sisters, year of birth, marital status, level of education, annual income, employment in agriculture, and parental land inheritance and ownership and whether or not her parents were dead had on whether or not she inherited land. Almost all of the same variables were used for men; however, because of the dataset used, marital status and parental land inheritance were excluded for men.

For individuals who did inherit land, a multiple linear regression was also carried out to determine what effect a woman's year of birth, level of education, annual income, number of siblings, and number of sisters had on the amount of land she inherited. The

total land her parents own(ed) and the amount of land her mother inherited were also included as factors. For men, year of birth, level of education, annual income, number of siblings, and number of sisters were included in the regression, as was the total amount of land his parents owned, but, due to lack of data, the amount of land his mother inherited was not included.

2. Literature

There are many factors that can affect whether a person inherits land from their parents. This section reviews the literature relating to how land inheritance varies by gender, year of birth, income, education, number of siblings, marital status, whether a person works in agriculture, whether a person's parents inherited land, and whether a person's parents are dead. Literature about Bangladesh specifically is lacking for many of these variables, so information on other South Asian or patrilineal societies is sometimes used instead to produce plausible predictions.

Gender

Whether a person is male or female plays a large role in whether a person inherits land or not. For Bangladeshi women, their primary occupation is household labor. In this dataset, for example, out of 944 women, 834 (88%) listed housewife as their primary occupation. Women can earn money by selling eggs and raising some livestock, but they typically receive no money for their work, because this labor is considered to be part of their unpaid household labor (Subramanian, 1998). Women in all of Bangladesh average 11.1 hours of work a day on domestic and agricultural tasks, with an average 3.1 hours a

day on agricultural work, though that rises to 4.4 hours a day during the busy season. Women in rural areas average 4.4 hours a day on agricultural tasks year-round. This is not much lower than the average amount of time rural men spend on agricultural tasks, 5.1 hours a day (Zaman, 1995).

In 2008, of all the land holdings in Bangladesh, 95.39% were headed by men, and 4.33% were headed by women. This is a slight increase from the 3.48% of women who headed households in 1996 (BBS, 2010). The Gender Inequality Index (GII) measures inequality between men and women regarding reproductive health, empowerment, and the labor market and ranges from 0 (complete equality between sexes) and 1.0 (women are treated as badly as possible on all measures). The GII for Bangladesh is .518, and Bangladesh ranks 111th out of 148 countries. On the Social Institutions and Gender Index (SIGI), which measures the underlying causes of gender inequality, using indices like discriminatory practices, violence against women, and son preference, in 86 countries outside the Organization for Economic Cooperation and Development, Bangladesh ranks 63rd (OECD, 2012).

A 1990 survey of 1,839 households in Jamalpur and Jessore, Bangladesh, found that 28% of the labor in crop farming comes from women. Even though the survey was conducted more than 20 years ago, the author states that little has changed regarding the amount of female labor in agriculture, so he believes these figures are still representative (Rahman, 2010). SOFA and Doss (1998), using more recent data, found a similar figure, reporting that 32% of agricultural labor in Bangladesh was done by women. Despite this, only 7% of farm holders were women in 2014 (IFAD, 2014).

In Bangladesh, women can inherit as either widows or daughters. Because this dataset asks women about the land they inherited from their parents, daughters' inheritance rights are emphasized in this paper instead of widows' inheritance rights. According to the Qur'an, Muslim women, about 90% of the female population of Bangladesh, are entitled to half the amount of land their siblings receive. Among Hindus, who comprise about 10% of Bangladesh's population, women do not have the right to inherit land, although they sometimes do inherit (Scalise, 2009).

A woman's ability to inherit land is hampered by what activists call the good-sister syndrome, wherein women do not claim their due inheritance, believing that their siblings will then assist them if needed (Who owns Bangladesh?, 2013). Women in Bangladesh typically do not claim their property unless it is freely given and their inheritance is supported by their entire family. Women frequently refuse their inheritance so they can be allowed to visit their natal home or request their siblings' assistance when needed (Pereira, 2002; Scalise, 2009).

According to the Qur'an, widows with children are entitled to inherit one-eighth of their husband's property, and widows without children are entitled to one-fourth of their husband's property. Even if women are entitled to land, they frequently do not inherit it, either because they are not aware of their right to the land or, if they are aware of their rights, they lack the social and financial resources to enforce their ownership. Women without sons or with young sons who are unable to fight for their mother's rights have little recourse if their deceased husband's siblings and/or father refuse(s) to give the women their land. To sue for land requires money, which many of the women do not have. The Muslim Family Law Ordinance was passed in 1961 to introduce laws that

provided more rights to women, to ensure they inherited their share of property, but it has not affected most Bangladeshi women (Subramanian, 1998).

Another possible reason women in Bangladesh possess less land than men is that traditional South Asian marriage is exogamous, with women leaving their home village and moving into their husband's village upon marriage. This practice is still the dominant form of marriage in Bangladesh, but it can leave women without a support system if they need help claiming their inherited land in their natal village. This practice also means that women are not present to oversee any property they do inherit from their parents. Arens (2011) describes one woman who agreed to sell 167.5 square meters of her land to a local, friendly peasant. However, he used her thumbprint (used as a signature in Bangladesh among the illiterate) to get 3,345 square meters for the same price. Because the woman was illiterate and she lived with her husband in his village, she did not realize what happened until she was widowed and left her husband's home to return to her parental home. She was unable to recoup her stolen land. Arens reports anecdotally that this is a common problem among women who inherit land from their parents. In 2007, Arens found that only 36% of women with landed parents inherited land from their parents, an increase from 30% in 1975, though the change was not statistically significant.

Arens (2011), though, notes that siblings often fail to reciprocate their sisters' sacrifices. In an attempt to repair this situation, the Bangladesh Awami League (BAL), one of the two largest political parties in Bangladesh, swore in its 2008 election manifesto that, "Discriminatory laws against the interest of women will be rectified," meaning that women would be able to inherit the amount of property dictated by the law

(BAL, 2008). This goal has remained low on BAL's priority list and no actions to improve women's situations have been taken, even though BAL won a landslide victory in 2008 and reelection in 2014 (Who owns Bangladesh?, 2013). Hefazat-e-Islam Bangladesh, a fundamentalist Islamic group, was founded in January 2010, partially in response to BAL's attempts to increase women's rights (AP, 2011), which could be one reason for BAL's lack of action.

In traditional Bangladeshi society, a bride-price was paid by the groom's family to the bride's family. In the 1950s, though, the practice of dowry began to rise, and dowry has now almost completely replaced bride-price (Esteve-Volart, 2004; Ambrus, Field, & Torero, 2010). Now, a woman's dowry, even though it is often given to her husband or her husband's parents, is considered to be her inheritance or 'share' of family property. It is believed she has no need to inherit land from her parents, because she already received her dowry as her inheritance. Along with the mahr, a mandatory payment by the groom or his father to the bride at marriage dictated by Islamic custom, the dowry is meant to be used as a safeguard against divorce and as protection for the woman in case of widowhood (Huda, 2006). If a woman does inherit land, she has more power in her household and family and, if her husband dies or divorces or abandons her, the likelihood that she will be forced to depend on her natal family is reduced (Scalise, 2009). Inheritance is the single-most common way for women to gain property, because women purchasing property is generally disapproved of (Giovarelli et al., 2005).

Because gender plays such a large role in land inheritance (Agarwal, 1994), rather than using gender as a categorical variable, males and females are split into two different groups. However, **I predict that women will be less likely to have inherited land than**

men. I also predict that women who do inherit land will, on average, inherit less land than men.

Year of birth

In the 1960s and 1970s, Bangladesh's fertility rate averaged 6.8 births per woman. By 2013, that number had dropped to 2.2 births per woman (World Bank, 2015). Despite this decrease, other than a few micronations like Singapore and Monaco, Bangladesh has the highest population density of any country in the world with 1,102.2 people per square kilometer. In 2014, Bangladesh had a population of 166 million, making it the eighth-most-populated country on Earth (CIA, 2015).

As a side effect of this increase in population and the subsequent division of each family's land among children, there is less land for each person to inherit, even if inheritance is limited solely to sons. The average amount of land a person owns in Bangladesh is reported to have decreased over the years (IFAD, 2014). In a study of a clan in north-central Bangladesh, Akanda and Ito (2008) found that from 1900 to 1925, sub-clans owned an average of 40.00 hectares (400,000 m²), but from 1996 to 2004, sub-clans averaged 16.94 hectares (169,400 m²). To ameliorate this problem, several land reforms have been undertaken by the Bangladeshi government. However, these reforms have been ineffective, with problems in implementation and continuing decreases in land owned by the average household (Rahman, 1998). Sen (2003) further classified this by a family's level of wealth. Households that remained poor from 1987 to 2000 had lost 12% of the land they owned in 1987 by the year 2000. Households that remained wealthy

during that period lost 30% of the land they cultivated, while households that increased in wealth from 1987 to 2000 increased their land by 42%.

In addition to its increasing population decreasing the amount of land each person can inherit, Bangladesh also loses about 1% of its arable land every year, due to environmental degradation, natural disasters, and rapid urbanization (Scalise, 2009). Vinding and Kampbel (2012) claim that this loss of land affects women more, because men are better able to emigrate or seek wage-paying jobs.

Thus, it would be expected for the amount of land inherited to decrease as a person's year of birth increases. It is also likely that older people are more likely to have inherited, because their parents are more likely to be deceased. **I predict then, for both men and women, that as a person's year of birth increases, they become less likely to inherit and, if they do inherit, they will inherit smaller amounts of land.**

Income

Over time, Bangladesh's income inequality has increased, with wealthy people gaining more property and poorer people losing property (World Bank, 2015). In 2002, the wealthiest 10% of rural households in Bangladesh owned 47.2% of the land, while the poorest 50% of households owned only 5.7% of the land. Land ownership is distributed much less evenly than income in rural areas (Griffin, Khan, & Ickowitz, 2002). Among rural households, 77% report being on either a deficit or break-even economic status, with 18% always in deficit. Difficulties in stabilizing Bangladesh's economy have come from frequent natural disasters, changes in food prices, and political upheaval (CIA, 2015).

Other small, developing countries, such as Japan in the 1960s and South Korea in the 1980s, have had problems similar to Bangladesh's current situation – a small surface area, large population, high population density, and high income inequality. Griffin, Khan, and Ickowitz (2002) note that it would be almost impossible to redistribute the land evenly in Bangladesh, as was done in Japan and South Korea and which helped to improve both countries' economies, because the price of land in Bangladesh is 17 times higher than the annual net output of the land. In South Korea and Japan, those values were 1.5 and 2.5, respectively. The authors write that implementing the same solution in Bangladesh would cost the government \$18 billion and would not provide a long-term solution to Bangladesh's high levels of poverty.

De la Cadena (1995) reported that, as incomes rose in Quechua communities in Peru, land inheritance became more egalitarian, regardless of gender. As land became more fragmented and it lost its value, women were more likely to inherit land. De Janvrey, Sadoulet, and Wolford (2001), looking at developing rural areas worldwide, agreed with de la Cadena, arguing that increasing the number of jobs and possible income sources led to further divisions of land and more people inheriting land.

The literature, then, for both Bangladesh and other countries, indicates that, as a person's income rises, they are more likely to inherit land. **My prediction, then, is that as a man or woman's income increases, the more likely he or she is to inherit land.** And, because land is so expensive in Bangladesh, **I also predict that, as a person's income rises, the amount of land they inherit also rises.**

Education

From 1970 to 1990, the percentage of children enrolled in primary school in Bangladesh ranged from a low of 50.95% in 1971, the year of Bangladesh's liberation war with Pakistan, to a high of 80.56% in 1990. Over those two decades, the percentage of Bangladeshi children enrolled in school averaged 70.38%. No data was available from 1991 to 2004, but by 2005, 98.54% of children were enrolled in primary school. Secondary school enrollment had a similar jump – on average, 19.06% of children were enrolled in secondary school from 1973 to 1990, and, on average, 47.79% were enrolled in secondary school from 1998 to 2012. The ratio of girls to boys in primary and secondary school averaged 51.66 in the 1970s, 63.09 in the 1980s, and 107.13 in the 2000s (World Bank, 2015).

In the rural Philippines, a traditionally patrilineal society, land is used to grow rice, which requires strength and intensive labor, so sons inherit more land than do daughters. Estudillo, Quisumbing, and Otsuka (2001) suggested that parents offset their increased investment in sons (i.e.: land inheritance) by investing more heavily in their daughters' educations. They argue that, because their parents invested in the women's education and the women were expected to earn income through non-agricultural means, women with more education would be less likely to inherit land. Similarly, Quisumbing and Otsuka (2001) noted that, in the parts of rural Sumatra with lower levels of average education, women were also more likely to inherit land. Additionally, when women did inherit, they tended to inherit more land. Sumatra, though, is a traditionally matrilineal society, so land inheritance there follows different traditional rules than it does in

Bangladesh. Moreover, it should also be noted that neither study controlled for income, which could also have an impact on income's relationship with land inheritance.

On the other hand, several sources (Deere & León, 2003; Giovarelli et al., 2005; Roy, 2011) noted that when women are better educated, they are more knowledgeable about their rights and so are less likely to cede their land to their siblings or other family members. These educated women are better able to defend against any attempts, whether by siblings or other natal village members, to steal their land.

These are two opposing arguments – one says that educated women are less likely to inherit, because they were given an education in lieu of land inheritance, while the other says educated women are more likely to inherit, because they are more aware of their rights. None of this research, though, dealt directly with Bangladesh. Roy's research (2011) on India agreed with Deere and León (2003) and Giovarelli et al. (2005) that women with higher levels of education were more likely to inherit and to inherit more land when they did inherit.

There are similar arguments made about the effect of education on men's inheritance, although all researchers predict weaker effects, largely because men traditionally have the right to inherit. A lack of education might make them slightly less likely to inherit because of a lack of knowledge about the bureaucratic requirements to register land (Griffin, Khan, and Ickowitz, 2002), but better educated men might receive an advanced education instead of land (de Janvry & Sandoulet, 2001). **I predict, then, that women with higher levels of education are more likely to inherit and to inherit more land. I also predict that increased levels of education will increase a man's chances of inheriting land and will increase the amount of land a man inherits,**

although I suspect its effect will not be as strong as education's effect on women's land inheritance.

Siblings

Whether or not a person has siblings can also affect whether or not they inherit land and how much they inherit. A person with no siblings becomes, by default, their parents' preferred choice for an heir. Parents with multiple children, however, must decide how best to split their land; do they wish to allow only one child to inherit or to practice partible inheritance? Partible inheritance, in which property is divided among heirs (Berkner & Mendels, 1978), guarantees more of their children inherit land, but the family's land is split into smaller and smaller pieces, which makes the family land-poor after a number of generations.

While unigeniture, wherein only one child inherits (Grieco & Ziebarth, 2014), prevents an estate from being apportioned, it also prevents many of a family's children from receiving a permanent resource (Hrdy & Judge, 1993). In rural Bangladesh, sexist egalitarianism, a term used by Hrdy and Judge (1993) to refer to inheritance patterns in which all children of one sex receive the same amount of resources and children of the other sex inherit fewer or no material goods from their parents, is the most-frequently practiced method of inheritance. Sexist egalitarianism in Bangladesh means that each son traditionally inherits equal amounts of land, and each daughter inherits a smaller amount of land and/or a dowry. However, in Bangladesh sons often remain on the estate, so the land is not legally apportioned or divided, reducing the likelihood that the estate will fragment (Amin, 1998). As industrialization has occurred in Bangladesh, more men have

left their natal villages to work in cities or other countries, so inheritance patterns are changing (Siddiqui, 2005).

This thesis examines whether a person's number of siblings and number of sisters have an effect on whether that person inherits land. Quisumbing and Otsuka (2001) reported that, among men and women in Sumatra, a matrilineal society, the number of sisters a person possessed had a significant but slight negative effect on the amount of land a person inherited, but the number of siblings did not. Yamano (2007), though, reported that neither the number of siblings nor the number of sisters was significant with regard to land inheritance in Kenya, a traditionally patrilineal society.

Men in Bangladesh are traditionally the sole inheritors of land (Subramanian, 1998; IFAD, 2014), and Agarwal (1998) wrote that women in South Asia tend to cede their inherited land to their siblings, so perhaps men with sisters are more likely to inherit. **Thus, I predict that, the more siblings a woman possesses, the less likely she is to inherit land and, if she does inherit, the less land she will inherit. I predict that a woman's number of sisters will have no effect on whether she inherits, but a larger number of sisters will reduce the amount of land a woman inherits.**

Because Agarwal (1998) argues that women with siblings were likely to give that land to their siblings, **I predict that men with sisters will be more likely to have inherited land and, if they did inherit, to have inherited more land.** However, a larger number of siblings seems logically to decrease the amount of land inherited per person, because an equal split would lead to each person receiving less land. **Thus, for men, I predict that, while an increased number of siblings is likely to reduce the amount of**

land they inherit, the number of siblings is unlikely to have any effect on whether or not the man inherits.

Marital status

Previous research (Estudillo, Quisumbing, & Otsuka, 2001) showed that married children, male or female, in the rural Philippines inherited more land on average than do their unmarried siblings. Others, using data from Kenya (Fleuret, Downs, & Reyna, 1988) and Latin America (Deere & León, 2003), noted that married women are more likely to have their inheritance recognized than are unmarried women. However, Agarwal (1998) wrote that parents in rural India prefer to have their unmarried daughters inherit land, rather than their married daughters, although all daughters are placed behind sons and widows in inheritance preference. Agarwal also wrote that married women inherit less land than unmarried women. She suggested this difference in inheritance due to marital status was because unmarried daughters had no husband to provide for them.

Thus, although literature from other parts of the world indicates that married women are more likely to inherit and to inherit more land, the literature dealing with South Asia indicates the reverse, so **I predict that unmarried women are more likely to have inherited.** Because all of the men used in predicting land inheritance were the husbands of the respondents, they were all married, so marital status for husbands is not used as a predictor variable.

Distance from natal village

Women in Bangladesh typically marry outside of their natal village into a

neighboring bari (Cain et al., 1979). This means that women who inherit land from their parents might find it difficult to maintain that land, especially if they marry into a bari far from their natal village (Arens, 2011). For this reason, women whose new home is located far from their parental home might be less likely to inherit land. **I predict, then, that, the further a woman's new home is from her natal village, the less likely she is to inherit.** Distance from natal village was not used to predict amount of land inherited, because it reduced the sample size to less than 20. Because men remain in their parents' home after marriage, this variable is not used for men.

Whether mother or father inherited land

Because data was not collected about whether a respondent's husband's parents inherited land, this variable was not included for men in our sample, thus I only make predictions for women for these variables. With respect to women, then, Agarwal (1998) found that daughters whose fathers owned and/or inherited land were unlikely to inherit land. In a sample of 241 women in South India whose fathers owned land, only 18% inherited land. This percentage was even lower in North India, where only 8% of 229 women with land-owning fathers inherited land. **I predict, then, that a woman's likelihood of inheriting will not be affected by (or might be slightly negatively correlated with) whether or not her father inherited.**

Deere and León (2003) found that mothers in Latin America were more likely than fathers to will their land to their daughters. In Agarwal (1998)'s sample, Kerala, a state in Southern India, included mothers as well as fathers as landowners with land to inherit, because Kerala historically practiced matrilineal inheritance. Among 65

daughters, 28 (43%) inherited land, a much higher percentage than in any other region. **I predict, then, that women whose mothers inherited land are more likely to inherit land.**

Whether mother or father is alive or dead

Land inheritance in South Asia is post-mortem (Agarwal, 1990). Although a daughter's dowry can be considered a form of inter vivos inheritance (Huda, 2006), land is only inherited after death (Mahapatro, 2013). This indicates that respondents and their husbands would not inherit land until their mother or father had died, so I predict that **a person, male or female, whose mother and/or father is dead is more likely to have inherited land than someone whose parents are living.**

Agricultural work

Deere and León (2003), Estudillo, Quisumbing, and Otsuka (2001), and Quisumbing and Otsuka (2001) all agreed that parents were more likely to will land to children who had backgrounds working in agriculture. Because of this consensus, **I predict that both men and women who work in agriculture are more likely to inherit land than men or women who do not work in agriculture.** For women, there is also a variable about whether their husband works in agriculture, based on the assumption that a woman's parents would be more likely to will land to a daughter whose husband could help manage that land. **I predict that women whose husbands work in agriculture are more likely to have inherited land.**

Whether parents own land

Whether a person's parents own land is included as a variable on the assumption that a person whose parents owned land is much more likely to have inherited land than someone whose parents did not own land and so do not have land for a child to inherit. **I predict that, for both men and women, a person is more likely to have inherited land if their parents own land.** While a directional prediction is possible for this variable, it is largely used as a control in the following analyses.

3. Study Population

The villagers of Matlab, a rural subdistrict of Chandhpur District in Bangladesh have traditionally engaged in agriculture, among other subsistence strategies (Holman & O'Connor, 2004). However, increasing employment opportunities both locally and internationally, has decreased the participation in agriculture and subsistence (Novak, 1993; Kabeer, 2001). Muslims make up the majority of the population, with a Hindu minority. Families live close to their kin (Aziz, 1979). Polygyny is legal in Bangladesh, but its frequency has decreased from 5.6% of new marriages in Matlab in 1980 (ICDDR,B, 1982) to 2.1% in 2010 (ICDDR,B, 2012a).

The vast majority of people living in this region own some land; a 2005 census of the Matlab region found that only 6% of households owned no homestead land. However, cropland is a different matter. Fully 43% of households owned no cultivable land and another 30% owned less than .5 acres (2023.4 m²), meaning over 70% of the population

was landless or functionally landless. The number of households without cultivable land has been increasing over the past few decades; 26% had no land in 1982, 38% in 1996, and 43% in 2005 (ICDDR,B, 2007).

As with the rest of Bangladesh's rural population, people in Matlab now rely less on agriculture as their main source of income than they did in the past. In 1996, 31.0% of people reported that agriculture was their largest source of income (ICDDR,B, 1998). By 2005, only 14.2% reported that agriculture was their largest source of income despite the strongly rural and agricultural character of the region. Instead, employment had shifted to labor and/or business. With respect to the main or primary occupation of male household heads, 16.1% farmed land they owned, 15.5% worked in agricultural labor, 18.6% worked in business, and 10.0% worked in service. For female household heads, the main occupation was housework, employing 81.3% of them. Combining the primary occupations of all household heads, male and female, 16.2% farmed land they owned, sharecropped, or rented, and 12.2% worked as agricultural laborers. For other household members, 2.8% of people farmed land they owned, sharecropped, or rented, and 2.6% worked as agricultural laborers (ICDDR,B, 2007). These figures fail to capture the diversity of sources of income within rural Bangladesh households, however, as most families have income from multiple sources including wage labor, some type of farming or agricultural labor, and remittances from labor migrants in Bangladeshi cities or abroad.

The total sex ratio of the Matlab region is 91.1, meaning there are 911 males for every 1000 females. Among the young (ages 0 to 14) and the elderly (ages 75 or more), the sex ratio was above 100, but among people in their 20s and 30s, the sex ratio was below 80, largely due to male emigration for work. The Matlab population, in addition to

skewing female, also skews younger. People under the age of 20 comprised 43.5% of the region's population, as is common in growing populations. People over the age of 60 were only 8.9% of the population (ICDDR,B, 2007).

Along with the rest of Bangladesh, education rates in Matlab have increased over the past few decades. In 1996, 40.5% of the population had no schooling, 39.1% had four or more years of education, and only 7.5% had ten or more years of schooling (ICDDR,B, 1998). By 2005, 30.3% of the population had no schooling, 51.1% had four or more years of schooling, and 9.5% had ten or more years of education. In both years, males had, on average, more education than females, although the difference between the genders decreased over time. In 1996, 25% of males and 15% of females had at least seven years of education, but that had changed to 33% of males and 27% of females in 2005. In the youngest cohorts, females appear to be better educated than males, with 32% of males and 37% of females aged 7 to 14 having four or more years of schooling (ICDDR,B, 2007).

The average age at marriage for women in Matlab in 2011 was 20.2, while the average age at marriage was 28.5 for men. Only 3.5% of women over the age of 30 had never married. The age of marriage has been increasing gradually for females. For every year before 1985, the average age of marriage for females was under 18, but, for every year after 1985, females' average age at marriage has been over 18 (ICDDR,B, 2012b).

4. Methods

Data and variables

A survey of 944 women aged 20-64 was conducted between April and August of 2010 in Matlab, Bangladesh. Detailed demographic data has been collected on about 250,000 people in the Matlab study area as part of the Health and Demographic Surveillance System (HDSS) run by the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B). This sample of women was randomly drawn from a list of all the women aged 20 to 64 in the HDSS sample, with measures taken to ensure equal representation for women from three 15-year age categories (20-34, 35-49, and 50-64).

The Institutional Review Boards of both the University of Missouri and the ICDDR,B, approved of the methods of data collection and ensured that the ethical standards of the 1964 Declaration of Helsinki were followed. Prior to their participation in the survey, all participants gave informed consent.

Surveys took place in the respondent's family compound, and averaged about one hour in length. The whole survey included questions about marital status, education, residence patterns, family demographics, health, and income. Hundreds of questions were asked in the interview. In this analysis, responses to the following questions dealing with the respondent's family and background will be included: their year of birth, their marital status, their mother's year of birth and whether she was living or dead at the time of the survey (i.e.: 2010), their father's year of birth and whether he was living or dead in 2010, their number of siblings, their number of sisters, their highest level of education, their

current household's income, and their occupation(s). For women who were married, the following questions were asked about their husbands' families and backgrounds: their year of birth, their highest level of education, their annual income, their occupation(s), their father's year of birth and whether he was living or dead in 2010, their mother's year of birth and whether she was living or dead in 2010, their number of siblings, and their number of sisters.

Because this thesis is focused on land inheritance, particular focus was given to the questions dealing with land ownership and inheritance. The questions providing information on land asked: for respondents, their fathers, mothers, and husbands, how much land they inherited and why (or why not) they inherited land; for the respondents' maternal grandparents, respondents' paternal grandparents, respondents' parents, and husbands' parents, how much homestead land and cropland they owned.

Homestead land refers to land used for occupation, including a house, cookhouse/kitchen, yard, and kitchen garden, while cropland refers to land used for growing crops. Acreage values were given in a variety of traditional Bangladeshi units, which were converted into square meters to provide a consistent and familiar unit of measurement. The units used in the survey were decimals (13.375 m²), koras (20.0625 m²), gondas (80.25 m²), and kanis (1605 m²). A unit called "acore" was also used by four respondents, but no reliable, consistent equivalent for acres was found, so those respondents were excluded from the study.

Most information provided was input into the analysis as provided, but, for a few questions, the data had to be manipulated. Respondents were asked their mother's year of birth. For 107 women, the year of birth given for their mother was either impossible or

unlikely (e.g.: the mother was born the same year as the daughter or the mother was 60 when the daughter was born). For mothers whose years of birth were too late (i.e.: the mother would not have reached puberty when her daughter was born if the mother's year of birth were accurate), their year of birth was decreased so they were listed as being 15 when their daughter was born. For women whose mothers' years of birth were too early (i.e.: the mother would have been menopausal when her daughter was born if her year of birth were accurate), their year of birth was increased, so the mother was listed as being 45 when her daughter was born. This is the only variable where the data in the analysis was actually changed. Mother's year of birth is only used in Figures 1 and 3 to demonstrate how women's land inheritance has changed over time; it is not used in the regressions and analyses that follows, so these alterations to the data have no effect on these results.

Women were also asked their household's annual income. This variable, though, had a strong positive skew. To make income's distribution normal and allow it to be used appropriately in regression analyses, the natural log of the annual household income was used rather than the actual value. There was no question that specifically asked women whether they had inherited land, so that variable had to be created. One of the questions asked women the amount of land they inherited; women who provided an amount of land were listed as having inherited land. Another question asked women if they had inherited land and why or why not. There were ten possible responses to this question. For women who did not provide an amount of land they had inherited, responses to the second question were used. Women who reported they had inherited and still used the land or they had inherited but since sold the land were listed having inherited land. Women who

chose another explanation (that the land had not yet been inherited, their parents had no land, they were from a Hindu family, the land is under the river, their relatives use the land and give them crops or money, their relatives use the land and they expect nothing, they were in a land dispute with their relatives, or they do not ask about their inheritance for fear of breaking the family relationship) were listed as *not* having inherited land. The same information was available for the women's mothers, fathers, and husbands, and the same process was repeated for those individuals.

Another question asked what a woman's marital status (i.e.: married, married but abandoned, divorced, widowed, or never married) was at the time of the survey. Women who had never married were listed as single, and women who had been married at any time, including women who were widowed or divorced at the time of the survey, were listed as married. For men, this variable was not included, because all data for men was based on women's responses about their husbands. Thus, all men included in the dataset must perforce be married.

Respondents were also asked what occupation(s) they engaged in. Women who reported they owned and used, rented, or sharecropped farmland were listed as working in agriculture, and the rest were not. Women were also asked this question about their husbands' occupations, and their husbands were classified as either working in agriculture or not.

A final variable worth nothing has to do with number of siblings. Respondents were asked how many brothers and how many sisters they had who had lived past the age of ten. They were asked the same question for their husbands. For each individual, these numbers were combined to calculate number of siblings. Number of siblings and number

of sisters, rather than number of brothers and number of sisters, was used in the analysis, because this gave me an idea of an individual's total number of siblings. Additionally, birth order was added to the analysis for both men and women, but it was removed from the analysis, because it was significant in no cases and because it dramatically reduced the sample size.

Analysis

Summary statistics from survey data are summarized in Table 1 for women and Table 2 for men. Respectively, the values in each column are the number of individuals for that variable, the mean value for linear variables or the percent responding yes for dummy variables, the standard deviation, and the range.

As Table 1 shows, there were 941 women who provided information on whether or not they had inherited land. About one-fifth (19.3%) of these women had inherited land. For women who had inherited, the average amount of land inherited was 464.2 m². Most respondents (93.9%) had married, and the average age at the time of the survey (in 2010) was 41 years. Women averaged 2.6 siblings and 3.1 sisters. They averaged 4.2 years of schooling and a household income of 83,118.2 taka, which was equivalent to about \$1,179 in 2010. The median household income was rather lower, 51,000 taka.

Table 2 shows that 887 women provided information on whether their husbands had inherited. Among the 66.7% of men who had inherited, the average inheritance was 604.2 m². At the time of the survey, men were, on average, 52 years old. Almost half (45%) of men worked in agriculture as either owners, sharecroppers, or agricultural laborers. Men average 3.1 siblings and 2.2 sisters. Because household income was used, husbands had the same average income as wives – 83,118.2 taka.

Table 1. Summary statistics for all respondents

These summary statistics show the sample size, mean or percent, standard deviation, and range for all the dependent and independent variables included in the regression analyses dealing with women.

Variable Category Variable Name	N	Mean or %	Standard Deviation	Range
Outcome Variables				
Has respondent inherited land?	941	19.3% yes	0.4	0-1
Amount of land respondent inherited ¹	179	464.2	988.9	13.5-6,420.0
Amount of land respondent inherited (ln)	179	5.0	1.4	2.6-8.8
Respondent Characteristics				
Year of birth	944	1969	12.7	1942-1990
Is respondent married? (dummy)	944	93.9% yes	0.2	0-1
Highest level of education	944	4.2	4.0	0-16
Household income ²	944	83,118.2	144,729.1	0-3,000,000.0
Household income ² (ln)	850	10.9	1.1	6.7-14.9
Respondent works in agriculture? (dummy)	944	0.5% yes	0.1	0-1
Distance – natal village to current home ³	884	78.8	103.4	0-1800
Family Characteristics				
Did father inherit land? (dummy)	943	92.4% yes	0.3	0-1
Did mother inherit land? (dummy)	944	16.8% yes	0.4	0-1
Did/do parents own land? (dummy)	943	97.6% yes	0.2	0-1
Is father dead? (dummy)	887	57.8% yes	0.5	0-1
Is mother dead? (dummy)	886	33.9% yes	0.5	0-1
Number of siblings	870	4.7	1.9	1-11
Number of sisters	884	3.1	1.5	1-9
Land Amounts				
Total land owned by parents ¹	597	5836.2	16472.3	40.1-210,436.7
Total land owned by parents (ln)	597	7.7	1.3	3.7-12.2
Amount of land mother inherited ¹	137	942.4	1590.5	13.5-12,952.0
Amount of land mother inherited (ln)	137	5.7	1.5	2.6-9.5

¹ Land amounts are in meters².

² Income was recorded in Bangladeshi taka in 2010.

³ Distance is given in minutes.

Table 2. Summary statistics for husbands

These summary statistics show the sample size, mean or percent, standard deviation, and range for all the dependent and independent variables included in the regression analyses dealing with the respondents' husbands.

Variable Category Variable Name	N	Mean or %	Standard Deviation	Range
Outcome Variables				
Has husband inherited land?	887	66.7% yes	0.5	0-1
Amount of land husband inherited ¹	572	604.2	2,124.3	13.5-40,125.0
Amount of land husband inherited (ln)	572	5.2	1.4	2.6-10.6
Personal Characteristics				
Year of birth	885	1958	14.1	1923-1991
Highest level of education	885	5.0	4.5	0-16
Household income ²	944	83,118.2	144,729.1	0-3,000,000.0
Household income ² (ln)	850	10.9	1.1	6.7-14.9
Husband works in agriculture? (dummy)	886	45.0% yes	0.5	0-1
Family Characteristics				
Did/do parents own land? (dummy)	883	68.9% yes	0.5	0-1
Is father dead? (dummy)	667	74.5% yes	0.4	0-1
Is mother dead? (dummy)	639	50.6% yes	0.5	0-1
Number of siblings	678	4.7	1.5	1-11
Number of sisters	680	2.2	1.4	0-8
Land Amounts				
Total land owned by parents ¹	524	6,277.0	21,004.2	93.6-364,217.0
Total land owned by parents (ln)	524	7.7	1.4	4.5-12.8

¹ Land amounts are in meters².

² Income was recorded in Bangladeshi taka in 2010.

Regression was conducted using the Statistical Package for the Social Sciences (SPSS) for data analysis. A binary logistic regression examined whether the respondent inherited as the dependent variable and the respondent's year of birth, her marital status, her highest level of education, the natural log of her household income, her number of siblings, her number of sisters, whether she worked in agriculture, whether her mother inherited land, whether her father inherited land, whether her parents own(ed) land, whether her mother was dead, and whether her father was dead as the independent variables.

Another binary logistic regression was conducted for respondents' husbands, with whether the husband inherited as the dependent variable and his year of birth, his highest level of education, the natural log of his annual family income, his number of siblings, his number of sisters, whether he worked in agriculture, whether his parents own(ed) land, whether his mother was dead, and whether his father was dead as independent variables. Multicollinearity was examined in both regressions and, in all cases, the variance inflation factor (VIF) was below 2.5, indicating low levels of multicollinearity.

A multiple linear regression was also conducted using the amount of land a woman inherited as the dependent variable and her year of birth, her highest level of education, the natural log of her household income, her number of siblings, her number of sisters, the homestead land and cropland owned by her maternal grandparents, the homestead and cropland owned by her paternal grandparents, the homestead and cropland owned by her parents, the amount of land her father inherited, and the amount of land her mother inherited as independent variables. A similar multiple linear regression was conducted for husbands, using the amount of land he inherited as the dependent variable

and his year of birth, his highest level of education, the natural log of his annual household income, his number of siblings, his number of sisters, the homestead land owned by his parents, and the cropland owned by his parents as the independent variables.

For the men, all of the VIFs were below 2.5. However, the model dealing with the amount of land women inherited had very high levels of multicollinearity, with multiple VIFs reaching over 100. This is logical, because the amount of land a woman's parents inherited, the amount of land her parents owned, and the amount of land her grandparents owned will obviously overlap. Mean-centering was used to reduce the multicollinearity, but it was ineffective. After trying various combinations of variables, the most comprehensive model with acceptable multicollinearity retained the woman's year of birth, her level of education, her number of siblings, her number of sisters, the log of her household income, the total (homestead land plus cropland) land owned by her parents, and the amount of land inherited by her mother. With these variables, all of the VIFs were below 2.5.

Although p-values could determine which variables had a high level of significance, they could not tell which model was the best. For the linear regressions, the GLMSELECT command was used to find the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and Schwartz Criterion (SBC). These determined which model was best. These methods did not work for the binary logistic regressions, so another method was used.

To determine this, variables for each of the models was entered into Statistical Analysis Software (SAS). For the binary logistic regression models, the GLMSELECT

function was used to determine the best model for each number of variables (e.g.: the best model using one variable, the best model using two variables, etc.). Each model provided a chi-square score, with the difference between each number of variables slowly decreasing. So, for example, the chi-squared score for the best one-variable model was 70.40, and the chi-squared score for the best two-variable model was 79.93, a difference of 9.53, while the chi-squared score for the best eleven-variable model was 95.38, and the chi-squared score for the best twelve-variable model was 95.51, a difference of only 0.12.

To determine the point at which differences in the chi-squared values between different models was no longer significant, the inverse chi-squared value was calculated for one degree of freedom at the 0.90 significance level. One degree of freedom was used, because each comparison compared a model with another model that had one more variable, which added one degree of freedom (e.g.: a two-variable model was compared with a three-variable model). Any model adding less than this value to the chi-squared score indicated that the newer model was less effective than the previous model.

5. Results

Inheritance by gender and time

Figures 1 and 2 show the number of men and women respectively who inherited land, grouped by year of birth. Individuals who reported not yet having inherited were removed from these figures. Figures include both respondents and their mothers for women and husbands and fathers for men. Women, on average, were less likely to have inherited land than men. Women born between 1959 and 1968 were most likely to have inherited land,

Figure 1. Histogram of women’s land inheritance by year of birth

This figure shows whether or not women inherited land after women were divided into 10-year cohorts and after women whose land had not yet been inherited were removed from the sample (N = 1413). The length of the bar indicates the number of women, thus women born between 1959 and 1968 comprise the largest category and 25% of them have inherited land.

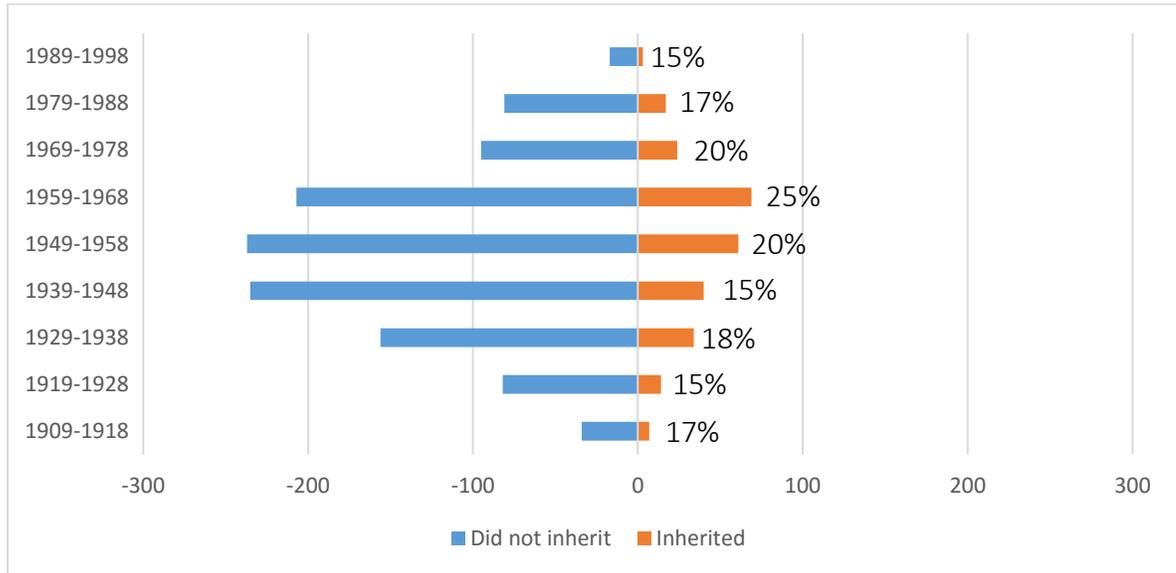
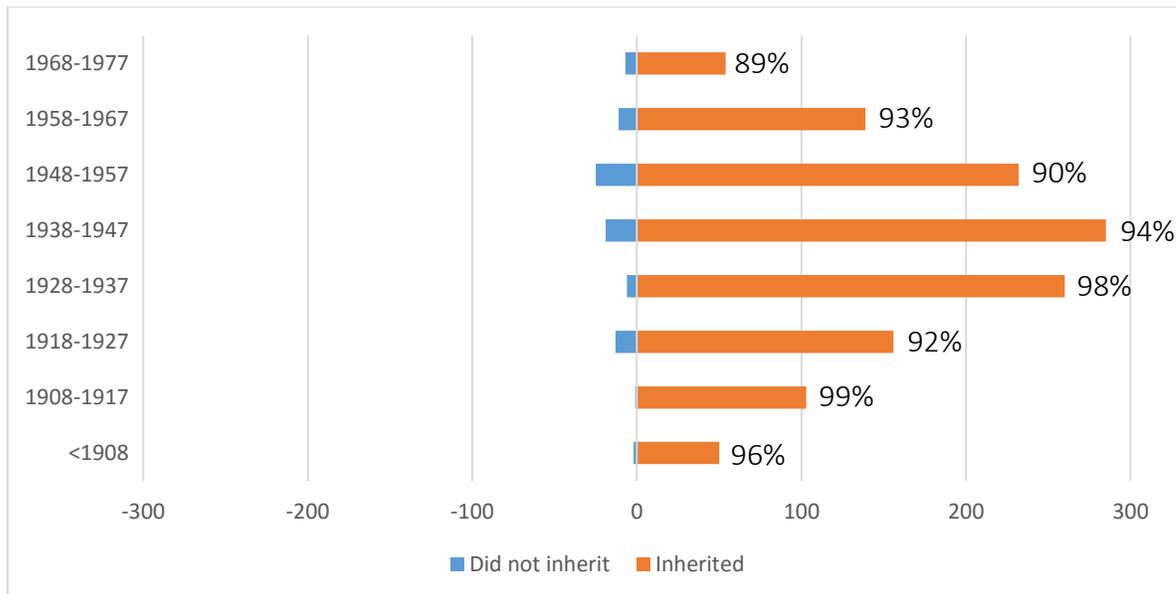


Figure 2. Histogram of men’s land inheritance by year of birth

This figure shows whether or not men inherited land depending on their year of birth after men whose land had not yet been inherited were removed (N = 1363). The length of the bar indicates the number of men, thus men born between 1938 and 1947 comprise the largest category and 94% of them inherited land.



with 25% having inherited. This figure is smaller than the percentage of men inheriting in all of the men's age cohorts, the smallest of which was 89% for men born between 1968 and 1977.

To more clearly illustrate the differences between men and women, Table 3 shows the percent of men and women in all age categories who did or did not inherit land for each reason. The most common response for men (73.02%) was that they had inherited and still used land, while the most common response for women (49.61%) was that relatives used their land and they expected nothing in return. As with Figures 1 and 2, this table shows information for respondents, their mothers, their fathers, and their husbands.

To provide an idea of how land usage has changed over time for men and women, Figures 3 and 4 map the responses to how land has been used for men and women, respectively. They have been grouped by year of birth into ten-year intervals. Both figures show that the number of people who have not yet inherited has increased over time. These tables include respondents, their mothers, their fathers, and their husbands; everyone has been included, including people who have not yet inherited. People have been grouped by year of birth into ten-year intervals. As would be expected, both figures show that the number of people who have not yet inherited increases along with year of birth, meaning simply that younger people are less likely to have inherited.

Among females, counting both respondents and their mothers, there was a sample of 1418 who had already received their inheritance, and only 271 (19.1%) of them had inherited land. For the 1374 men who had already received their inheritance, 1288 (93.7%) inherited land. A t-test indicated the rates of inheritance between men and

Table 3. Inheritance of land by gender

Survey respondents were asked whether they, along with their husbands, mothers, and fathers, had inherited land and, if so, what they had done with that land, or, if not, why they had not inherited. This figure shows the percentages by category for males (N = 1716) and females (N = 1796).

	Female	Male
Land owned and used by inheritor	4.43%	73.02%
Land not yet inherited	22.05%	20.75%
Land has been inherited but has since been sold	2.51%	0.93%
No land to inherit	0.22%	0.99%
Relatives use land, inheritor receives crops/cash	0.50%	0.00%
Relatives use land, inheritor expects nothing	49.61%	0.47%
Would have inherited but land is under river	2.34%	3.67%
Hindu family	10.69%	0.00%
Don't ask b/c will break relationship with family	7.52%	0.00%
In land dispute with relatives	0.11%	0.17%

Figure 3. Women’s inheritance of land by year of birth

This figure shows whether respondents and their mothers have inherited land and if not why not. The women have been sorted into 10-year age cohorts by year of birth (N = 1791). Each column lists the number of women in the age cohort.

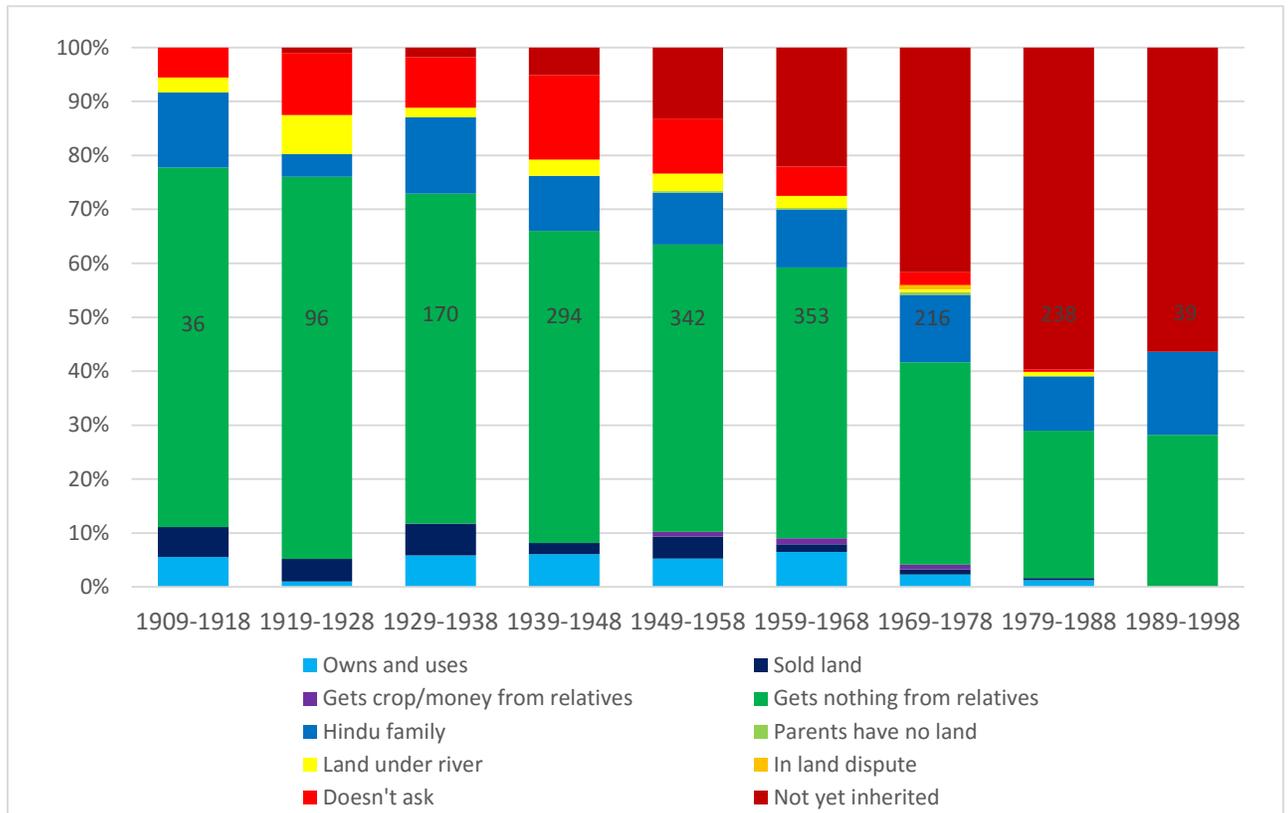
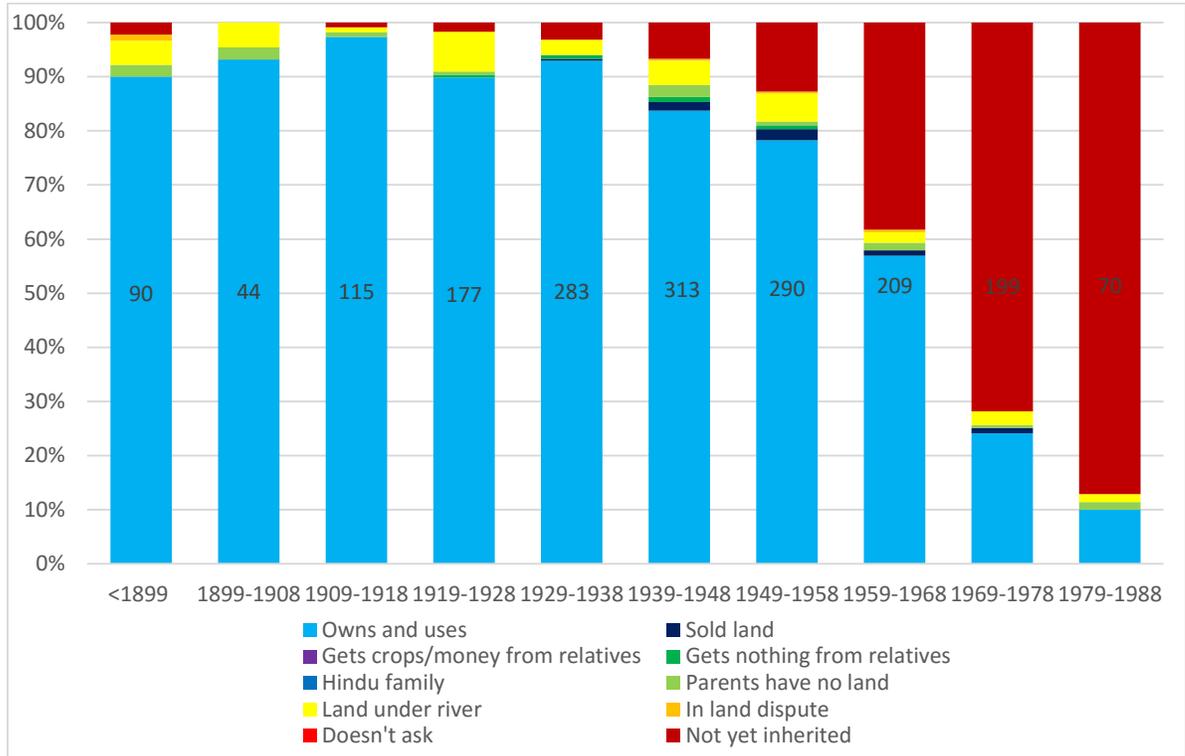


Figure 4. Men's inheritance of land by year of birth

This figure shows whether respondents' husbands and fathers have inherited land, and if not why not. The men have been sorted into 10-year age cohorts by year of birth (N = 1715). Each column lists the number of men in the age cohort.



women differed at the 0.001 significance level. The average amount of land inherited among 316 women who reported inheriting land was 671.52 m². The average land inheritance among the 1194 men who inherited some amount of land was 1364.50 m². A t-test showed indicated the two populations were different at the 0.001 significance level.

Whether women inherit land

According to the regression equation looking at whether or not women inherited land, only four variables were significant to the 0.05 level (see Table 4). One of these variables was whether or not a woman's mother inherited land. A woman's likelihood of having inherited land increased by 0.35 times when her mother had inherited land. A second significant variable was year of birth; each additional year decreased a woman's chances of having inherited land 0.003 times. The third significant variable was whether a woman's husband worked in agriculture. Women whose husbands worked in agriculture were 0.077 times more likely to have inherited land. The final significant variable was whether a woman worked in agriculture; doing so increased a woman's likelihood of having inherited land by 0.69 times. It should be noted, though, that only 5 of the 779 women in this analysis worked in agriculture, so they did not form a large sample of the population and the result may not be reliable (though it is consistent with theory and other results). None of the other variables had a significant effect.

Whether men inherit land

Table 4 also shows the regression effects for whether or not men inherited land. As with women, there were four significant variables for men. Men who worked in

Table 4. Regression results for whether men and women inherit

The regression results show the effects of covariates on whether or not women inherited land (N = 779) or men inherited land (N = 589). Statistical significance is represented as follows: *** p < 0.001; ** p < 0.01; * p < 0.05; † p < 0.10. Beta coefficient is unstandardized. Individuals who have not yet inherited have been removed from this sample. Adjusted R² for women is 0.124 and for men is 0.422.

Variable Category Variable Name	Women		Men	
	Beta Coefficient	(Standard Error)	Beta Coefficient	(Standard Error)
Year of birth	-0.003*	(0.002)	0.000	(0.002)
Is respondent married? (dummy)	0.086	(0.174)	-	-
Highest level of education	-0.001	(0.004)	-0.004	(0.004)
Household income (ln)	0.003	(0.015)	0.004	(0.017)
Works in agriculture? (dummy)	0.693***	(0.170)	0.116***	(0.034)
Husband works in ag? (dummy)	0.077**	(0.030)	-	-
Did father inherit land? (dummy)	-0.065	(0.058)	-	-
Did mother inherit land? (dummy)	0.354***	(0.038)	-	-
Did/do parents own land? (dummy)	0.156	(0.110)	0.460***	(0.045)
Distance – natal village to current home	0.000	(0.000)		
Is father dead? (dummy)	0.030	(0.033)	0.156***	(0.045)
Is mother dead? (dummy)	-0.038	(0.033)	0.076*	(0.038)
Number of siblings	-0.014	(0.010)	-0.005	(0.010)
Number of sisters	0.011	(0.013)	0.002	(0.015)

agriculture were 0.12 times more likely to have inherited land, with significance below the 0.01 level. Men whose parents owned land were 0.46 times more likely to have inherited land, also with a significance below the 0.01 level. The final two significant variables for men were whether their mother and/or father were deceased. Men whose fathers were dead were 0.16 times more likely to have inherited land, and men whose mothers were dead were 0.076 times more likely to have inherited land. No other variables had an effect that was significant at the 0.1 level.

Comparing whether men and women inherit land

A model was created for women and another model for men that used variables that were applicable to both men and women. These models, then, excluded variables, such as whether the person was married or whether their parents inherited, that were only available for females. The results of these models are displayed in Table 5, which allows comparison between the strength and direction of variables for men and women.

When variables affecting both men and women were combined, only one variable, whether the person worked in agriculture, was significant for both genders. In this model, women who worked in agriculture were 0.60 times more likely to have inherited land, while men who worked in agriculture were 0.12 times more likely to have inherited land. Year of birth was significant for women but not for men; for every year later that females were born, they were 0.003 times less like to have inherited land. Because the same variables were used for men in this model as in the original, the same variables are significant to the same extent, so whether a man's parents owned land and

Table 5. Comparing variables for whether or not men and women inherit

The regression results show the effects of covariates on whether or not women inherited land (N = 780) or men inherited land (N = 589). The same variables were used for both men and women, which allows comparison of how variables affect men and women differently. Statistical significance is represented as follows: *** p < 0.001; ** p < 0.01; * p < 0.05; † p < 0.10. Beta coefficient is unstandardized. Adjusted R² for women is 0.022 and for men is 0.422.

Variable Category Variable Name	Women		Men	
	Beta Coefficient	(Standard Error)	Beta Coefficient	(Standard Error)
Year of birth	-0.003**	(0.002)	0.000	(0.002)
Highest level of education	-0.002	(0.005)	-0.004	(0.004)
Household income (ln)	-0.010	(0.015)	0.004	(0.017)
Works in agriculture? (dummy)	0.602*	(0.179)	0.116***	(0.034)
Did/do parents own land? (dummy)	0.151	(0.108)	0.460***	(0.045)
Is father dead? (dummy)	0.035	(0.035)	0.156***	(0.045)
Is mother dead? (dummy)	-0.031	(0.034)	0.076*	(0.038)
Number of siblings	-0.016	(0.010)	-0.005	(0.010)
Number of sisters	0.010	(0.013)	0.002	(0.015)

whether his mother and/or father were dead were significant for men, in addition to whether he worked in agriculture.

Amount of land women inherit

Only 179 women reported inheriting a non-zero amount of land. Because so few women inherited land and because some of the variables in this model were difficult for respondents to answer when they did not always remember the details, sample size for a regression dealing with the amount of land women inherit is small. This number was reduced even more, when the amount of land a woman's mother inherited was included. Because that variable was significant at the 0.001 level, Table 6 includes the natural log of the amount of land a woman's mother inherited.

In that case, the women's model had a sample size of 128. Table 6 shows that it had three variables that were significant at the 0.05 level. The first significant variable was the amount of land a woman's mother inherited; for each additional log of the total land a woman's mother inherited, the natural log of the amount of land the woman had inherited increased by 0.75. A second significant variable was the woman's highest level of education; each additional year of schooling increased the natural log of the amount of land the woman had inherited by 0.014. The final significant variable was the natural log of the amount of land the woman's parents owned. For each additional log, the natural log of the amount of land a woman had inherited increased by 0.45.

Amount of land men inherit

Because men were more likely to inherit land, there is a larger sample size (N =

Table 6. Regression results for the amount of land men and women inherit

The regression results show the effects of covariates on the natural log of the amount of land women (N = 50) or men inherited land (N = 265). Statistical significance is represented as follows: *** p < 0.001; ** p < 0.01; * p < 0.05; † p < 0.10. Beta coefficient is unstandardized. Adjusted R² for women is 0.713 and for men is 0.190.

Variable Category Variable Name	Women		Men	
	Unstandardized Beta Coefficient	(Standard Error)	Unstandardized Beta Coefficient	(Standard Error)
Year of birth	0.034	(0.019)	0.003	(0.006)
Highest level of education	0.014**	(0.055)	0.061***	(0.018)
Household income (ln)	0.066	(0.143)	0.030	(0.074)
Number of siblings	0.022	(0.123)	-0.135**	(0.051)
Number of sisters	-0.177	(0.172)	0.043	(0.070)
Land owned by parents (ln)	0.451**	(0.144)	0.299***	(0.058)
Land mother inherited (ln)	0.749***	(0.139)	-	-

265) for the men's model than the women's model. Table 6 shows that, as with the woman's model, there were three significant variables. The first was the natural log of the amount of land owned by the husband's parents, which increased the natural log of the amount of land the man had inherited by 0.030. The second was the amount of education the man had earned. For each additional year of education, the natural log of the amount of land the man inherited increased by 0.061. The final significant variable was the husband's number of siblings. For each additional sibling, the natural log of the amount of land the man inherited decreased by 0.14.

Comparing amounts of land men and women inherit

Table 7 shows the results for the amount of land inherited once the amount of land a woman inherited from her mother had been removed. This increased the sample size for women to 128, although the men's model remained the same. Once this had been done, level of education and land owned by parents remained significant for women, and the natural log of the woman's current household income became significant at the 0.1 level. For every natural log increase of the woman's household income, the natural log of the amount of land she had inherited increased by 0.16.

Removing the amount of land the woman's mother inherited also gave both the men's and women's models the same variables, which allows comparison between the strength and direction of variables for men and women. For both the men and women, level of education and amount of land parents owned were significant, and both were positively correlated with the natural log of the amount of land inherited. Household income was

Table 7. Comparing results for the amount of land men and women inherit

The regression results show the effects of covariates on the natural log of the amount of land women (N = 128) or men inherited land (N = 265). The same variables were used for both men and women, which allows comparison of how variables affect men and women differently. Statistical significance is represented as follows: *** p < 0.001; ** p < 0.01; * p < 0.05; † p < 0.10. Beta coefficient is unstandardized. Adjusted R² for women is 0.376 and for men is 0.190.

Variable Category Variable Name	Women		Men	
	Unstandardized Beta Coefficient	(Standard Error)	Unstandardized Beta Coefficient	(Standard Error)
Year of birth	0.007	(0.012)	0.003	(0.006)
Highest level of education	0.073**	(0.036)	0.061***	(0.018)
Household income (ln)	0.162†	(0.108)	0.030	(0.074)
Number of siblings	-0.112	(0.070)	-0.135**	(0.051)
Number of sisters	0.137	(0.095)	0.043	(0.070)
Land owned by parents (ln)	0.608***	(0.080)	0.299***	(0.058)

significant for women but not for men, and number of siblings was significant for men but not for women.

6. Discussion

Results

All of the original predictions are listed in Table 8, along with information on whether the prediction was supported or not. The first predictions, claiming that men were more likely to inherit and that women would inherit less land, were both supported at the 0.001 significance level. Much has been written (Agarwal, 1990; Agarwal, 1994; Agarwal, 1998; Rahman, 2010; Arens, 2011; SOFA & Doss, 2011) about the differences in inheritance between men and women in Bangladesh and South Asia, and these results support these other researchers.

This prediction that men would inherit more land accords with Bangladeshi law. However, this difference between male and female inheritance is more extreme than should be allowed by Bangladeshi law, which follows the Qu'ran (Muslim Personal Law, 1937). According to the Qu'ran, a woman should inherit half of the land her male siblings inherit (Qu'ran 4:11). Respondents were not asked about the amount of land their siblings inherited, so I cannot determine if a woman inherited half of the land her sibling(s) inherited, as required by law. Women who inherited land did inherit slightly less than half (671.52 m²) the land men inherited (1364.50 m²), but only 19.3% of women inherited land, compared to 66.7% of men.

Table 8. Results of predictions

This table lists all of the predictions made and whether those predictions were supported by the results presented in this paper.

Prediction	Supported?
Prediction 1. Men are more likely to have inherited land than women and, when women have inherited, they inherit less land than men.	Supported
Prediction 2. As birth year increases, likelihood of having inherited decreases as does the amount of land inherited.	Supported for women; no effect for men
Prediction 3. A person's likelihood of having inherited increases with income; amount of land inherited also increases with income.	Partially supported: effect only for amount of land women inherit
Prediction 4. The more education a person has, the more likely he or she is to have inherited and the more land she will have inherited.	Partially supported: effect for amount of land inherited
Prediction 5. Men and women whose parents own(ed) land are more likely to have inherited.	Supported for men; no effect for women
Prediction 6. The more siblings a woman possesses, the less likely she is to have inherited and the less land she will have inherited. Number of sisters will have no effect on whether a woman inherits but will reduce amount of land inherited.	Partially supported: no effect for any of these variables
Prediction 8. The more sisters a man possesses, the more likely he is to have inherited and the more land he will have inherited.	Not supported: no effect
Prediction 9. Number of siblings has no effect on whether a man has inherited but will reduce the amount of land he inherits.	Partially supported: effect only for amount of land inherited
Prediction 10. Married women are more likely to have inherited land.	Not supported: no effect
Prediction 11. Women who live further from their native bari are less likely to inherit land.	Not supported: no effect
Prediction 12. Women whose mothers inherited are more likely to have inherited land and will have inherited more land.	Supported
Prediction 13. Whether a woman's father inherited land will have no effect on whether she has inherited.	Supported
Prediction 14. People whose mother and/or father are dead are more likely to have inherited land.	Partially supported; effect for men only
Prediction 15. People who work in agriculture are more likely to have inherited land.	Supported
Prediction 16. Women whose husbands work in agriculture are more likely to have inherited land.	Supported

It was predicted that, as time went on, people would be less likely to have inherited land and would have inherited less land when they did inherit. However, year of birth did not significantly predict the amount of land inherited for either men or women. For men, it also was not a significant predictor for whether they had inherited land, but it was for women. This lack of significance for men and for amount of land clashes with the literature, which states that people have inherited less land and have been less likely to inherit land in Bangladesh in the recent past (Rahman, 1998; Sen, 2003; Akanda & Ito, 2008) than they were decades before. This change for women might be due to laws (Government of Bangladesh, 1995; Government of Bangladesh, 1999) passed recently in Bangladesh that attempt to eliminate discrimination against women. And perhaps land inheritance over time has not changed for men, because the reports of decreasing amounts of land are not occurring in Matlab.

Income was a significant predictor in only one of the regression analyses; for women, it was a significant predictor at the 0.1 level of the amount of land they inherit. Its positive direction accords with the predictions, but its lack of significance for other variables does not. Uddin and Haque (2009) suggest that the wealthy in Bangladesh are diversifying their money by investing in things other than land, so people from wealthy families might inherit something other than land. For poorer families, though, owning land remains an extremely important bulwark against extreme poverty, so they might be more likely to will their land to their children.

For both men and women, a person's level of education was not a significant predictor of whether they had inherited land, but it was a positive predictor for the amount of land inherited. When children in Bangladesh are educated, they are spending

time that could be used to earn money for the family. Perhaps the reason amount of education is positively correlated with amount of land inherited is that wealthier families with more land can better afford to send their children to school.

A person's number of sisters was a significant predictor in no instance, which might be explained by the infrequency with which women inherit. For women, number of siblings also was not a significant predictor, which might, again, be explained by the unlikelihood of their inheriting. For men, number of siblings was not significant when discussing whether the man had inherited, but it did significantly reduce the amount of land he inherited. This agrees with the literature, since sons should always inherit land, but families with more children will need to divide their land up, which will reduce the amount of land there is for a son to inherit.

Although predictions were given for the other variables, they are being treated as controls here since we do not have the evidence to generate clear predictions. These variables include: woman's marital status, whether the man/woman works in agriculture, whether the woman's husband works in agriculture, whether the person's mother and/or father was dead, the distance from a woman's natal village to her current home, and whether the woman's parents inherited land. Some of these variables were significant predictors (whether the man/woman works in agriculture, whether the woman's husband works in agriculture, whether the man's mother and/or father were dead), but others were not (the woman's marital status, whether the woman's mother and/or father was dead, distance from natal village to current home, and whether the woman's father inherited land).

Limitations

One limitation of this survey was that it relied on verbal interviews and used a woman's memory to gather information. It is possible that these memories were not always accurate. For at least one variable, I know there were errors; when a respondent's year of birth was compared to her mother's year of birth, 107 out of 944 (11.33%) women gave a year that was biologically impossible or unlikely. However, knowledge of ages is notoriously unreliable in rural Bangladesh and other field populations as people often do not record or prioritize information on birth date or age as they do in more developed social contexts. Information on more socially relevant topics, such as whether someone has inherited and how much they inherited, is likely to be much more reliable. Other data cannot be double-checked in a similar manner, so I am forced to rely on the data provided. I can assume, however, that, while there may be errors, the errors are likely to be randomly distributed throughout the data.

A similar limitation of this survey is that it was based entirely on long interviews with a single person, which could make the data less reliable. This might be especially true for people who are more tangentially-related to the respondent, such as her husband's parents. This could mean that data for husbands (that is, men) is less accurate than it is for women.

One puzzling feature of the data can be seen when comparing Tables 1 and 2. When asked whether their parents own land, 97.6% respond positively, but, when asked whether their husbands' parents own land, only 68.9% of women respond positively. Because spouses typically marry someone who is their material equal, this difference in

land ownership might indicate that the information is inaccurate. Women might perhaps have had a recall error when asked about their husbands' parents' land.

A final limitation is that there are key variables that might have had an effect on whether people inherit land or that might have provided additional information, but that were not collected in this survey. For example, when people were asked how much land they inherited, it was not specified whether the land was cropland (i.e.: cultivable) or homestead land.

7. Conclusion

This study used data from a survey conducted in rural Bangladesh to learn more about land inheritance in the Matlab area. It compared how men and women inherit land, the factors that affect whether they inherit land, and what affects the amount of land they do inherit. Some previous research (e.g.: Agarwal, 1994, on differences in male and female inheritance in South Asia; Agarwal, 1998, on the effect sisters have on men's inheritance; Quisumbing and Otsuka, 2001, on how working in agriculture affects land inheritance; and Deere and León, 2003, on the effect mother's inheritance has on daughter's inheritance) was supported, although other research (e.g.: Agarwal, 1998, on marital status's effects on land inheritance; De Janvrey, Sadoulet, and Wolford, 2001, on income's effects on land inheritance; Akanda and Ito, 2008, on year of birth's effects on land inheritance; and Roy, 2011, on the impact education has on women's inheritance) was not.

Further research on this topic would further elucidate why some variables that had been significant in other populations were not significant among this population of Bangladeshis. A more thorough dataset, with information on all variables, might provide more information, though this is only likely through further data collection with more detailed questions.

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