# Livelihood decisions under the shadow of conflict in the Chittagong Hill Tracts of Bangladesh

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**Abstract**

We analyse rural household livelihood and children's school enrolment decisions in a post-conflict setting in the Chittagong Hill Tracts region of Bangladesh. The innovation of the paper lies in the fact that we employ information about current subjective perceptions regarding the possibility of violence in the future and past actual experiences of violence to explain household economic decision-making. Preferences are endogenous in line with behavioural economics. Regression results show that heightened subjective perceptions of future violence and past actual experiences of conflict influences current consumption increases child enrolment, and encourages risky mixed crop cultivation. The trauma emanating from past experiences combined with current high perceptions of risk of violence may induce bolder and riskier behaviour in line with prospect theories of risk. Furthermore, a,

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post-conflict household-level Phoenix or economic revival factor may be in operation, based in part on greater within group trust.

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# 1    Introduction

The object of this paper is to analyse rural household livelihood decisions, including educational investment for future generations, in a post-conflict setting located in the Chittagong Hill Tracts (CHT) region of Bangladesh. This is a region in the South-Eastern part of the country where a low level insurgency took place between 1976 and 1997, officially terminating after a peace accord in December 1997.[1] The armed struggle was between the state's security forces, mainly the Bangladesh army, and the ethnically distinct local population, in an otherwise fairly homogenous nation in terms of language and religion. The insurgency aimed at regional autonomy rather than independence, but the principal local grievance was against officially sponsored land encroachment and grabbing by outsiders who pose a threat not only to local livelihoods, but potentially also to a distinct local way of life; see Chakma (2006) and Roy (2000). All of this took place in the land-hungry context of the world's most densely populated country, which is also a low-income developing country where agriculture continues to be the main source of the population's livelihood. Thus, neo-Malthusian factors may be at work. Population growth adds to land scarcity, exacerbated by environmental degradation, fuelling conflict over land and environmental resources (Homer-Dixon 1999).

There is now a substantial literature on the causes of large-scale internal conflict in the rational choice tradition. These explanations have tended to centre on either the grievance hypothesis (mainly linked to inequalities between distinct groups delineated by ethnicity, religion, or some other marker), or the greed motivation (reflecting the competition over capturable rents); see Murshed (2010, chapter 3) for a review. A great deal of empirical work has also been conducted to test the empirical validity of these allegedly competing theories. The results are inconclusive, mainly due to data paucity on inter-group inequality (also known as horizontal inequality).

But the important point is that many of the quantitative studies on civil war are cross-country in nature, where the experiences of civil war in different and far-flung countries are lumped together in one single statistical (econometric) exercise. One can, therefore, be sceptical about the results of such regression analyses, as the various populations under scrutiny are not necessarily drawn from a homogenous population. Quite apart from this conceptual objection to cross-country quantitative analyses, there is also a need to conduct more systematic quantitative studies of the drivers and consequences of conflict at a more local level within nation states, a research area that is still relatively neglected.

Armed conflict may have far reaching consequences for rural livelihood strategies, including investment decisions and cropping patterns. This may contribute to analysis of poverty, as well as development in general, particularly rural development. Lacunae associated with localized conflict become even more acute when it comes to the economic analyses of the short and long term impacts of conflict on households' decision-making. The first innovation of the paper is that it is able to make a contribution in this connection, based on a unique data set compiled during a socio-economic survey of households resident in this area in 2007 (Barkat et al. 2009).

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[1] The conflict in the CHT of Bangladesh is coded as a minor armed conflict, according to PRIO-Uppsala methodology; see http://www.prio.no/CSCW/Datasets/Armed-Conflict/UCDP-PRIO/Armed-Conflicts-Version-X-2009/ (accessed on 5 November 2010).

The rural farming household is no stranger to risky outlays, as returns to cropping or animal husbandry are subject to a number of risks and uncertainties. We will utilize the livelihood framework to explain household decisions under uncertainty. This approach acknowledges an inherent inseparability between production and consumption decisions for rural households (Bardhan and Udry 1999, chapter 2) which affects labour allocation between farm and off-farm (including education) activities, as well as cropping (and animal husbandry activities) for own consumption and the market.

The nature of these risks and uncertainties can be altered by armed conflict of a sufficiently long duration. This affects the livelihood and investment decisions of households. We will relate our findings to prospect theory (Kahneman and Tversky 1979) to explain greater risk-taking behaviour following the traumas of war, where a strong desire to retrieve a valued past state may help explain increased risk-taking. This is the second innovation of the paper. Additionally, the survey employed in the paper contains information about subjective perceptions regarding the future prospects of violence after the conflict has ended, as well as past actual experiences of violence, which both impact on household economic decision-making. Thus we are dealing with preferences that are endogenous, not only to economic, political, and social institutions (Bowles 1998; Fehr and Hoff 2011), but also to personal histories of trauma and expectations of future conflict. Along with standard socioeconomic characteristics our household survey data contains both subjective (psychological) information regarding trust, current perceptions about the risk of future conflict, and objective data on past conflict experience. We relate these to observed livelihood decision-making. This is in line with contemporary behavioural economics, as well as earlier thinking by Boulding (1956) about individual self-image and the effect of various stimuli in framing one's image.

Our analysis is conducted in the post-accord era, a decade after a peace treaty which allegedly ended the war. As is well known, peace treaties across the developing world rarely coincide with the total cessation of violence, and the fear that conflict will reignite pervades many post-conflict societies. Collier, Hoeffler, and Söderbom (2008), in their cross-country study, point out that civil war is likely to resume within a decade in a typical developing country. Another important policy issue in post-conflict environments is the resumption of economic activity and growth. On the one hand, post-conflict growth can be lopsided, favouring infrastructure reconstruction over agriculture or manufacturing due to war time collateral damage, as well as the perceived riskiness of investment in productive sectors which take a long time to yield dividends (Addison and Murshed 2005). On the other hand, other authors emphasize a more general 'Phoenix' factor (Koubi 2005). In other words, rapid economic growth (in the aggregate macroeconomic sense) follows intense and prolonged hostilities. There can, however, be differences across various economic sectors. Our third innovation is that we examine whether there can be such a local Phoenix factor given the impact of subjective perceptions on household cropping decisions.

The rest of the paper is organized as follows. Section 2 contains a brief sketch of the context of the conflict, section 3 outlines a description of the data and methodology, section 4 presents our statistical (econometric) results, and section 5 is by way of conclusion.


## 2      The Chittagong Hill Tracts region of Bangladesh


Bangladesh is in the Ganges delta and is one of the most densely (1,229/sq.km) populated countries in the world where the amount of per capita arable land was only 0.1 hectares in

2007. It is a low-income developing country, where about 50 per cent of the population lives in poverty (using the international poverty line of below US$1.25 per day; World Bank 2010). Over last two decades, Bangladesh's economy experienced growth rates of around 5.5 per cent per annum, but a large part of GDP and employment still relates to traditional agriculture (World Development Indicators). This makes land the scarcest and most competed over resource in Bangladesh. Land grabbing is a common phenomenon in Bangladesh, and illegal practices and political patronage are often associated with land holding (Barkat and Roy 2008).

Bangladesh is mostly ethnically homogenous, with the vast majority of the population being Bengali speaking and Muslim. There are a few distinct ethnicities that differ in both language and religion. These groups are mainly concentrated in the CHT region. This region is situated in the southeastern part of the country, and is covered with lush green hills, with a relatively larger proportion of afforested areas. From a strategic point of view CHT is important as it adjoins two Indian states (Tripura and Mizoram), and also Myanmar or Burma. Insurgency in the Indian north-eastern states and Myanmar raises the military importance of this region (Roy 2000; Barkat et al. 2009; Mohsin 2003). The various ethnic groups in CHT are closer, in appearance and culture, to their neighbours in north-eastern India, Myanmar, and Thailand, than to the rest of Bangladesh. Buddhism, Hinduism, and Christianity are prevalent among these ethnicities. They have their own languages in both oral and written form. The indigenous peoples of CHT are often identified as *Jumma* people, derived from the word *jum* (swidden or slash and burn shifting cultivation). The proportion of the non-indigenous (Bengali speaking) population in CHT has been increasing over time. According to the 1991 population census of Bangladesh, indigenous groups constitute 51.4 per cent of the CHT total population of about one million (Mohsin 2003; Roy 2000). It is important to note that the indigenous inhabitants of CHT also exhibit a degree of diversity based on eleven different (tribal) identities.

Despite its lower population density compared to the rest of Bangladesh, the CHT region is actually land-scarce in terms of availability of land for cultivation (only 23 per cent of the land is arable). In 1974 the amount of per capita arable land was about 0.45 hectares, which declined to about 0.24 hectares in 1991. Most of the land is either non-inhabitable due to its topography, or its usage is restricted by law (reserve or protected forests). The land ownership patterns, as well as types of land in CHT, also differ from that of plain regions. Customary (common) ownership of land exists here, and at the same time private property rights are also recognized by the State, making ownership issues more complex (Roy 2000; Barkat et al. 2009).

The CHT region enjoyed an autonomous status until 1860 when the British took it over under their direct administration. The Chittagong Hill Tracts Regulation of 1900 put an embargo on 'outsiders' settling or purchasing land in the territory. This 'excluded area' status of CHT was replaced by a 'tribal area' classification in 1962. Due to the construction of an artificial reservoir by damming the river Karnafuli at Kaptai in the 1960s for the purposes of power generation, approximately 1,036 square kilometres were submerged, and 54,000 acres of highly prized arable land was lost in the river valleys.

Successive Bangladeshi governments of both a military and democratic complexion adopted mixed strategies of using military force to quell rebellion and protest, while at the same time encouraging, or colluding with, a population transfer programme. In 1976 armed forces were also deployed in CHT in a classic 'Aid to Civil Power' operation, which triggered tensions in the region. A few indigenous political groups (*Parbatya Chattagram Jana Samhiti Samiti* or PCJSS) engaged in armed struggle against the intrusion by the authorities. Under the counter-

insurgency strategy, demographic engineering interventions aimed at settling a large number of Bengali speaking households in CHT were seen as enhancing the size of population loyal to the state, and these fresh settlements acted as a counterweight to indigenous peoples' demands for rights and regional autonomy. Due to the state sponsored settlement programme, a considerable number of indigenous people were uprooted from their homesteads, something which helped to intensify the armed struggle. About 54,000 indigenous people took refuge in the neighbouring Tripura state of India, and another 50,000 indigenous people became internally displaced persons.

In the post-cold war era, and after the restoration of democracy in Bangladesh, pressure for a political solution mounted. This led to an accord between the *Parbotto Chattragram Jana Samhiti Samiti* (PCJSS) and the Government of Bangladesh on December 02, 1997, known as 'The Chittagong Hill Tracts Accord 1997'. The Accord was incomplete; the 'United Peoples Democratic Front (UPDF)' continues the struggle for full autonomy (Mohsin 2003). Continuing land disputes, the non-restitution of land to indigenous peoples, the presence of the Bangladesh army, the poor rehabilitation of refugees and internally displaced persons along with the non-implementation of a special status in the country's constitution make the post-conflict situation of CHT fragile. Indigenous people living in this area continue experiencing various types of violence and face restrictions on their mobility (Barkat et al. 2009).

## 3    Data and Methodology

The 'Socio-economic Baseline Survey of Chittagong Hill Tracts' is the source of our quantitative data; see Barkat et al. (2009). This survey was commissioned in 2007 and the data was collected in 2008 from a cross section of households (both migrant Bengalis and indigenous people) living in CHT. The study aimed at generating benchmark information to be subsequently used to track periodic progress attained through interventions by the CHTDF-UNDP.

The sample design of the survey captured the whole region of CHT, and especially the ethnic diversity among the indigenous population. The representative sample comprised 3,238 households, where the number of indigenous and migrant Bengali households was 1,786 and 1,452 respectively. The sampling procedure carefully considered the geographical and ethnic diversity of CHT and its population. Although the main focus of the survey was collecting data on the socio-economic status of the CHT population, it also gathered data on peace confidence-building issues. The measurable broader categories of variables are demographic, economic, social (education and health), cultural, infrastructure facilities, and peace-confidence-building data. In particular, what is noteworthy is that data on current post conflict subjective perceptions about the degree of violence, and the chance of its occurring in future, was collected from households for the year 2008. These pertain to their threat perceptions about the extent of armed conflict, the possibility of attacks from the other community and the fear of forcible eviction, as well as other variables at the time of the survey. Observe that these variables amount to expectations about the future prospects of conflict. In addition, household's actual experience of violence, or their participation in conflict, during the years of the insurgency (1976-97) was also collected related to displacement or eviction, loss of land and armed conflict among others. These refer to past experiences of violence. Not surprisingly there are missing observations, both on the perceptual as well as the actual past experiences of conflict, as not all households felt able to reveal this sensitive information, not least because of the continued presence of the

Bangladesh army in this area. Furthermore, we have data on the degree of trust (social capital), particularly among the various tribes that make up the indigenous population of CHT. Dataset also contains child specific information within the households.

## 3.1 Descriptive statistics

*Demographic and socio-economic characteristics of households*

People living in the CHT are relatively poorer than the rest of Bangladesh, and the average household size at 5.2 persons is larger than the Bangladeshi average of 4.8. There is a greater prevalence of female-headed households (36 per cent) in this region compared to 10.3 per cent for Bangladesh as a whole (Bangladesh Bureau of Statistics 2007). According to lower poverty line of the cost of basic needs (CBN) method, 74 per cent households are poor, while 85 per cent of households are poor according to CBN upper poverty line. More than half of the enrolled children (55 per cent) were going to community managed or Islamic religious school. A total of 31 per cent of enrolled children were going to a government school, and a very small proportion was found going to private and NGO schools. Most households (55 per cent) used the *jum* (slash and burn) method of agriculture, 31 per cent employed the plough, with 14 per cent using both techniques; see Table 1.

*Perceptions and actual experience of violence*

Perceptual data on the threat of violence pertains to the year of the survey (2008). This allows the researcher to analyse the nexus between perceptions of violence and various livelihood decisions in a post conflict setting. In Table 2 perceptions about the threat of violence relate to three variables: (i) perceptions about armed conflict, (ii) perceptions about communal violence occurring and (iii) the fear of eviction. In the survey, 15 per cent households perceived a threat of armed conflict, while about a third felt a danger of communal violence, and 36 per cent of households were apprehensive about possible eviction from their land.

Additionally, some 92 per cent of indigenous households felt that their group relations were good, implying the presence of trust within and between the eleven different tribes which comprise that community. It has to be borne in mind that the indigenous peoples' antagonists (settler Bengalis) are ethnically very homogenous and we would expect a high level of trust within that group. Only about 12 per cent of the responses elicited to good relations between the settler and indigenous communities. Data on real life experiences of conflict for the period of the insurgency (1976-97) were collected from households (with at least one family member experiencing violence) chiefly in the form of three broad categories: (i) displacement from home, (ii) dispossession of land (either farmland or homestead) and (iii) participation in and/or victim of armed conflict; see Table 2. Estimates indicate that 13 per cent of the households experienced displacement from their own home or land and 18 per cent were dispossessed of their farm land before the peace accord in 1997. All in all, various types of armed conflict were experienced by 18 per cent of the households.

Table 1: Key demographic and socio-economic characteristics of households

| Variables | Mean | Standard Deviation | Number of Observation |
|---|---|---|---|
| Demographic and related | | | |
| Household size | 5.22 | 1.9868 | 5023 |
| Mean age of household head (in years) | 39.16 | 13.5469 | 3234 |
| Sex of household head (male=1) | 0.64 | 0.4812 | 3234 |
| HH head never attended school | 0.54 | 0.4986 | 3234 |
| HH head completed primary school | 0.25 | 0.4329 | 3234 |
| HH head completed secondary school | 0.20 | 0.4008 | 3234 |
| HH head completed above secondary | 0.01 | 0.1049 | 3234 |
| Age of child (in year) | 7.21 | 4.8210 | 3970 |
| Age square of child | 75.30 | 84.950 | 3970 |
| Sex of child (male=1) | 0.63 | 0.4819 | 3970 |
| Ethnicity of household (indigenous=1) | 0.59 | 0.4925 | 5023 |
| Socio-economic and related | | | |
| Amount of land cultivated (decimal) | 232.71 | 333.46 | 3265 |
| Per capita amount of land cultivated (decimal) | 52.95 | 84.77 | 3265 |
| Per capita asset (in Tk.) | 10,846 | 22790 | 5023 |
| Poverty status (CBN Lower poverty line) | 0.74 | 0.4393 | 5023 |
| Socio-economic and related | | | |
| Poverty status (CBN upper poverty line) | 0.85 | 0.3488 | 5023 |
| HH electrification | 0.17 | 0.3755 | 3238 |
| Type of school studied | | | |
| government school | 0.31 | 0.4622 | 3970 |
| private school | 0.11 | 0.3164 | 3970 |
| NGO school | 0.03 | 0.1574 | 3970 |
| other type of school | 0.55 | 0.4973 | 3970 |
| Language of book (mother tongue) | 0.20 | 0.4008 | 3238 |
| Medium of instruction (mother tongue) | 0.20 | 0.4026 | 3238 |
| Type of cultivation | | | |
| Plough cultivation | 0.31 | 0.4623 | 5023 |
| *Jum* cultivation | 0.55 | 0.5505 | 5023 |
| Both *jum* and plough cultivation | 0.14 | 0.3469 | 5023 |

Source: authors' estimation.

Table2: Household status on perception and experience of violence

| Variables | Mean | Standard Deviation | Number of Observation |
|---|---|---|---|
| **Current perception of violence** | | | |
| Fear of armed conflict | 0.16 | 0.3629 | 1840 |
| Fear of communal violence | 0.33 | 0.3278 | 1839 |
| Fear of eviction from land | 0.38 | 0.4859 | 1881 |
| **Previous experience of violence** | | | |
| Displacement | 0.13 | 0.3363 | 5023 |
| Land dispossession | 0.18 | 0.3891 | 5023 |
| Armed conflict | 0.18 | 0.3871 | 5023 |

Source: authors' estimation.

*Livelihood decision-making variables*

Three household livelihood decisions: consumption expenditure, decisions with regard to children's schooling, and production (cropping) decisions are analysed. Data on consumption incorporated a separate format for food and non-food expenditure. The average per capita annual cash-equivalent consumption expenditure for a household was Tk. 11,867, with Tk. 11,110 and Tk.757.40 for food and non-food consumption respectively (Table 3).

We consider the decision to enrol children in school as an investment (human capital accumulating) decision. Data on total number of children enrolled in both primary and secondary school were analysed at the household level, within the age brackets 6-18 years. Estimates show that 44 per cent children of the CHT were enrolled in schools.

We consider 'Type of Crop Produced' as the proxy for production decisions. Data on types of cropping were categorized into food crops, cash crops, and mixed crops (both food and cash crop). Some 42 per cent of households produce only food crops, which is consistent with the socio-economic and cultural history of the CHT. Though an insignificantly small proportion of households produced only cash crops, there were a good number of households (52 per cent) producing both cash and food crops (annex Table 1).

## 3.2 Empirical model specification and strategy

Our quantitative analysis primarily focuses on the relation between either the perceived threat of violence after the peace accord, or the past experience of conflict before the peace treaty, on various livelihood decision-making by households living in the CHT. Our sample from the survey data set considers the population as a whole; both indigenous and migrant Bengali. The summary of specifications for household livelihood decision-making represented by consumption, investment and production decisions are shown in annex Table 2. For consumption decisions an OLS model was used. But for investment in children's education and production (cropping) decisions a Logit or Probit model was specified, as these two cases measure the probability or chance of an event occurring. We control for household demographic and socio-economic characteristics including those for children, type of school, facilities at the school, and agricultural techniques.

Table 3: Household livelihood status

| Variables | Mean Value | Standard Deviation | Number of Observation |
|---|---|---|---|
| Consumption Decision | | | |
| Per capita annual consumption expenditure (in Tk.) | 11,867 | 4501.676 | 5023 |
| Per capita annual food consumption expenditure (in | 11,110 | 4321.031 | 5023 |
| Per capita annual non-food consumption expenditure | 757.40 | 421.1768 | 5023 |
| Investment Decision | | | |
| Child enrolment in primary and secondary school | 0.44 | 0.4962 | 3970 |
| Production Decision: Type of cropping | | | |
| Only food | 0.42 | 0.4931 | 3265 |
| Only cash | 0.07 | 0.2491 | 3265 |
| Mixed (both food and cash) crop | 0.51 | 0.4998 | 3265 |

Source: authors' estimation.

The standard regression equation followed in this paper is as follows:

$$Y_i = \alpha + \beta_1\, HSE_{ij} + \beta_2 H_{ij} + \beta_3\, C_{ij} + \beta_4\, S_{ij} + \beta_5\, (\, V_{ij},\, PV_{ij},\, SC_{ij*}\, PV_{ij}) + \varepsilon_i$$

Where the dependent variable, $Y_i$ refers to various livelihood decision-making variables, consisting of consumption expenditure (continuous variable in logarithmic form), child enrolment in either primary and secondary school (dummy variable), and type of crop produced (dummy variable) for household $i$ measured in the survey. The explanatory variables are as follows: $HSE_{ij}$ are household-level demographic and socio-economic variables, $C_{ij}$ is a set of child characteristics (age and sex), $H_{ij}$ describes household head characteristics (age, sex and education), $S_{ij}$ denotes schooling variables, $SC_{ij}$ indicates social capital (trust within the indigenous group), $V_{ij}$ stands for threat perceptions at the time of the survey, $PV_{ij}$ indicates pre-peace accord experiences of violence, and $\varepsilon_i$ is a random error term.

Moreover, we use interaction variables for experiences of violence along with trust in three regression models. Trust (social capital) is not entered as a separate explanatory variable as current perceptions of violence approximate the obverse of between group (indigenous versus settler) social capital. It is only relevant in the case of trust among the various (eleven) indigenous ethnicities, and as a factor in how the impact of previous experiences of violence have evolved into present-day decision-making and preferences. Hence, we only use trust as an interaction term with past conflict experience.

To solve potential endogeneity problems in consumption we use 2SLS techniques, and instrumental variable (IV) methods for probit regression on cropping. Hausman tests of exogeneity and Alternative Hausman tests of exogeneity are employed to investigate the existence of endogeneity problems. We only report valid results in the main body of the paper; more detailed estimates are to be found in the annexes.

## 4    Results and discussions

This section analyses the determinants of household consumption decisions, followed by two other important livelihood decisions, investment in children's education and cropping (production) decisions, in relation to varying degrees of subjective perceptions of the threat of violence, within indigenous group trust factors and pre-peace accord experiences of violence. We believe this to be a major innovation of our study, because we attempt to gauge the

impact of subjective perceptions upon economic decision-making with regard to consumption, output (cropping), and investment decisions after an uneasy peace accord that only imperfectly ended the conflict. Within the context we are studying, land dispossession is a key factor, and the continuing fear of intimidation with a view to further land alienation is likely to impact on indigenous households' decision-making under uncertainty. To this end, and to sharpen our focus and analysis, we classify individual indigenous household's fears of future violence into different variables: armed conflict, communal violence, and fear of eviction from land.

## 4.1 Consumption expenditure

We endogenize preferences about consumption to conflict experiences and expectations about future conflict. According to the OLS estimation under specification 1 (Table 4), variables concerning contemporaneous perceptions about violence reigniting in the future: armed conflict, communal violence, and fear of eviction from own land have an influence on consumption expenditure as a whole and on food and non-food consumption separately. OLS estimates show that current perceptions of armed conflict have a negative influence of 10.7 per cent on overall consumption expenditure which is statistically significant ($p<0.01$). For food and non-food consumption expenditure the same negative influence is 10.4 per cent and 12.8 per cent respectively, and statistically significant ($p<0.01$). Fear of communal violence does not show a significant influence on overall consumption, while on food and non-food consumption it is statistically significant. The perceived threat of communal violence raises food consumption by 3.4 per cent (significant at $p<0.1$), whereas it reduces non-food consumption expenditure by 8 per cent (significant at $p<0.01$).

On the other hand, fear of eviction from the household's land positively influences consumption expenditure significantly ($p<0.05$). Households with this perception spend 4.7 per cent more on consumption compared to those households without this perception. In the case of food consumption households perceiving the possibility of eviction spent 4.6 per cent more on food consumption and 6.2 per cent on non-food consumption compared to those who do not have such a perception, and this result is significant at the 5 per cent confidence level (Table 4 ). Results also show that the fear of armed conflict recurring, fear of communal attacks, and the fear of eviction from land are jointly significant in determining amount of consumption expenditure, food, and non-food expenditure separately as well (significant at 1 per cent confidence level; annex Table 4).

Table 4 : Determinant of consumption expenditure: OLS estimation

| Independent Variable: | Dependent Variable | | |
|---|---|---|---|
| | All consumption expenditure | Food consumption expenditure | Non-food consumption expenditure |
| Specification 1: Current perception of violence | | | |
| Fear of armed conflict | -0.107*** (0.0217) | -0.104*** (0.0224) | -0.128*** (0.0260) |
| Fear of communal violence | 0.0260 (0.0200) | 0.0343* (0.0207) | -0.0798*** (0.0258) |
| Fear of eviction | 0.0468** (0.0209) | 0.0458** (0.0217) | 0.0620** (0.0267) |
| Specification 2: Previous experience of violence | | | |
| Displacement | -0.0559** (0.0254) | -0.0609** (0.0265) | 0.0129 (0.0300) |
| Land dispossession | 0.0007 (0.0177) | -0.0047 (0.0184) | 0.0635** (0.0258) |
| Past armed conflict | -0.0394** (0.0178) | -0.0313* (0.0184) | -0.133*** (0.0253) |
| Specification 3[#]: Interaction of previous experience of violence and social capital | | | |
| Displacement* Trust | -0.0195 (0.0714) | -0.0280 (0.0734) | 0.0227 (0.100) |
| Land dispossession* Trust | 0.0843 (0.0554) | 0.0757 (0.0573) | -0.030** (0.0965) |
| Past armed conflict* Trust | -0.058** (0.0590) | -0.054** (0.0600) | -0.137 (0.0881) |

Note: Estimation controls for variables; household size, per capita asset, age of household head, sex of household head, educational status of household head, household electrification status, enrolment of children, and log amount of cultivated land. Social capital is used as control for specification 2 only. Robust standard errors in parentheses. ***$p<0.01$, **$p<0.05$, *$p<0.1$. [#]To correctly interpret the interaction term, we check the joint test of significance for the relevant interaction term with the concerned variable and calculate the actual value of the coefficient on the mean value.

Source: authors' estimation.

It may be argued that there is an endogeneity issue between current perceptions of violence and consumption because households with greater economic capacity may feel more threatened. To get consistent coefficient estimates for consumption expenditure regression we attempted a two-stage least squares (2SLS) estimation approach where at the first stage we require instrumental variables. There are a few variables in our dataset that are potential candidates for instruments. For overall consumption and food consumption regressions we used three variables: good relationship between Bengali and indigenous communities, perceptions about the oppressiveness of the security forces, and previous land dispossession which are uncorrelated with consumption but correlated with our three variable of interest under current perceptions of violence. For non-food consumption, we used three variables: satisfaction about inter community interaction, attendance in other groups' festivals and festivals celebrated jointly which are found to be effective instruments. Results from 2SLS estimates found current perception of violence insignificant in determining overall consumption expenditure and for food and non-food consumption separately. However, since alternative Hausman tests of exogeneity indicate no endogeneity between current perceptions of violence and consumption expenditure when we compare OLS and 2SLS estimates (see; annex Tables 5-7), we can be confident about the reliability of our OLS estimates on consumption.

The regression results under specification 2 show that households with an experience of displacement from their home/land before the peace accord spend 5.5 per cent less on consumption as a whole and 6 per cent less on food consumption (significant at 5 per cent confidence level). Experiences of land dispossession during the conflict period motivate households to spend more on non-food consumption (6.3 per cent) and this positive influence

is found statistically significant at a 5 per cent confidence level. Households who were in armed conflict before the peace accord reduce overall consumption expenditure by 4 per cent (significant at 5 per cent confidence level), 3 per cent on food consumption (significant at 10 per cent confidence level) and 13 per cent on non-food consumption (significant at 1 per cent confidence level). Past experiences of violence in the form of displacement, land dispossession and armed conflict jointly have significant power (at 1 per cent and 5 per cent confidence level) in determining overall consumption, food consumption and non-food consumption expenditure (for details see; annex tables 8-9).

Further we attempted to investigate the role of trust (social capital) in the form of good relations among the various indigenous communities on consumption (specification-3, Table 4). Arguably, trust has an important role on livelihoods in post-conflict settings. Accordingly, we interact three variables on previous experiences of violence: displacement, land dispossession, and actual experiences of armed conflict with current good relations among the indigenous communities (trust) as a proxy of social capital. Specification-3 indicates that among the three interaction variables previous experiences of armed conflict along with good relations among indigenous communities is statistically significant ($p < 0.05$) for overall consumption and food consumption expenditures. Estimates reveal that households who trust members of their own community (a perception of good relations within and between various indigenous ethnicities) and who previously experienced armed conflict reduce their overall consumption by 5.8 per cent and food consumption by 5.5 per cent. This means they are saving more, including investment in agriculture. Similarly, non-food consumption expenditure falls by 3 per cent when households perceive good relations among indigenous communities and experienced land dispossession before the peace accord. The upshot of these results is that previous experiences of conflict combined with trust significantly impact on consumption preferences.

Greater trust appears to affect household preferences about consumption. In our case, as the households in question are farmers, a reduction in consumption implies more saving, including greater investment in farming and on agricultural inputs. Moreover, the past actual experience of conflict is salient in this regard. In line with the arguments of Fehr and Hoff (2011) social institutions impact individual preferences, implying that preferences are endogenous to social institutions and interactions. Conflict changes the nature of social interactions, local institutions, and the constraints (social rules) that individuals face. The previous experience of conflict when combined with trust between different indigenous tribes appears to encourage greater saving behaviour. This is also true when the fear of future armed conflict is involved. Consumption, however, rises when eviction or land dispossession is involved.

## 4.2 School enrolment

Decisions to enrol children in school can be a proxy of investment decisions for the future, and because children are potentially suppliers of household labour, it entails an opportunity cost.

Table 5: Determinants of child enrolment: probit estimation

| Explanatory Variables | Linear Probability Model | Logit, Marginal Effect | Probit, Marginal Effect |
|---|---|---|---|
| Specification 1: Current perception of violence | | | |
| Fear of armed conflict | -0.0039  (0.0248) | -0.0065 (0.0327) | -.0071 (0.0314) |
| Fear of communal violence | -0.01834  (0.0213) | -0.0227 (0 .0278) | -0.0208 (0.0268) |
| Fear of eviction | 0.0074    (0.0211) | 0.0087 (0.0277) | 0.0071 (0.0265) |
| Specification 2: Previous experience of violence | | | |
| Displacement from own home | -0.0066  (0.0282) | -0.0075 (0.0366) | -0.0073 (0.0346) |
| Land Dispossession | 0.0522** (0.0227) | 0.0701** (0.0301) | 0.0676** (0.0282) |
| Past armed conflict | 0.0015  (0.0218) | 0.0024    (0.0283) | 0.0025 (0.0271) |

Note: Estimation controls for variables; age of child, age square of child, sex of child, household size, per capita asset, age of household head, sex of household head, educational status of household head, type of educational institutions, language of book, and language of instruction. Social capital is used as control for specification 2 only. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' estimation.

Our Probit regression results of specification-1in Table 5 indicate that current perceptions of violence failed to explain variations in the likelihood of children's enrolment as the coefficients are statistically insignificant. Although their relation is insignificant, households perceiving a danger of eviction have a greater chance of sending children to school compared to those households who do not have this perception, while apprehensions about armed conflict and communal violence recurring reduce the chance of child enrolment.

In addition, pre-peace accord experiences of violence are found significant in the decision-making process regarding children's enrolment. Experience of land dispossession has a deep seated influence on current livelihood decision-making processes, which is evident in specification- 2 of Probit estimation (Table 5). It shows that households having a previous experience of land dispossession have a 6.7 per cent higher probability of sending children to school as compared to those households who did not encounter this form of violence. The positive and statistically significant determining role of the experience of land dispossession is found robust across various estimation procedures (Linear Probability Model, Logit, and Probit, see; annex Table 12). Pre-peace accord experiences of displacement and armed conflict do not separately have a significant influence on child enrolment, but both these variables, when accompanied with an experience of land dispossession, have a statistically significant relation (at 5 per cent and 10 per cent confidence level; see annex Table 13).The experience of land dispossession is traumatic, and creates long standing vulnerabilities, as land is the most productive asset. This may raise the likelihood of their sending their children to school, possibly with a view to overcoming the challenge of earning livelihoods from an ever decreasing amount of cultivable land. But the primary 'investment' motivation for schooling children is to allow future generations to acquire credentials so that they may escape the conflict and are less dependent on agriculture. This includes increased prospects of gaining formal and public sector jobs for their children (Badiuzzaman 2011). Moreover, we

attempted to investigate the role of trust (social capital) in the form of good relations among the various indigenous groups which is found to be insignificant. The interaction effect of past experiences of violence and social capital on probability of children's enrolment is also insignificant (annex Table 14).

## 4.3 Production decisions: cropping patterns

Our regression results regarding determinants of cropping decisions are reported in Table 6. In the first specification, fear of communal violence has a positive role in raising the probability of mixed cropping (both food and cash crops), which is statistically significant (p<0.1). Households fearing further communal violence in future have a greater chance (14 per cent) of growing mixed crops compared to households without such perceptions. Although the fear of eviction and apprehensions about armed conflict are separately statistically insignificant, their influence is jointly significant at a 1 per cent confidence level (see; annex Table 16).

There is a possible endogeneity between fear of communal violence and cropping decisions because households producing mixed crops might be more apprehensive as this requires more fertile land in terms of location and other factors, where land is central to the conflict. We have used a variable describing overall satisfaction in social interactions in the community as a whole as an instrument since it is related to fears of future communal violence and not correlated to mixed cropping decisions. Durbin-Wu-Hausman tests of exogeneity show that there is no endogeneity problem as such. We also tried Alternative Hausman tests of exogeneity and found the same result which implies that the coefficient of Probit model is preferable to the IV Probit (see; annex Tables 20-21). We also found our estimates robust across various models: LPM, Logit and Probit (see; annex Table 18).

Probit results under specification-2 show that previous experiences of armed conflict motivated households to engage in greater mixed cropping, where the probability is about 8 per cent higher than those households who did not have such experience (at 5 per cent significance). Although individually experiences of displacement from home and dispossession of land does not have significant influence on mixed cropping decisions, land dispossession along with armed conflict are jointly significant at 5 per cent confidence level (see; annex Table 17). In addition, we have attempted to investigate the role of social capital in cropping decisions. We interacted past experiences of violence and good relations among the indigenous communities (trust) as a proxy of social capital, but did not find these terms to be statistically significant (see; annex Table 15).

Table 6: Determinant of cropping decisions: probit and iv probit estimation

| Explanatory Variables | Mixed Crop: Probit, Marginal Effect |
|---|---|
| Specification 1: Current perception of violence | |
| Fear of armed conflict | -0.0036 (0.0447) |
| Fear of communal violence | 0.1405*** (0.0408) |
| Fear of eviction from own land | 0.0031 (0.0432) |
| Specification 2: Previous experience of violence | |
| Displacement from own home | -0.0156 (0.0433) |
| Land dispossession | -0.0532 (0.0357) |
| Past armed conflict | 0.0789** (0.0388) |

Note: Estimation controls for variables; Household size, Per capita asset, Age of household head, Sex of household head, Educational status of household head, Amount of cultivated land, and Type of cultivation techniques (jum, plough and both). Social capital is used as control for specification 2 only. Robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1. Source: authors' estimation.

Our findings are qualitatively similar to that of Nillesen and Verwimp (2010) for post-conflict rural Burundi, where the cultivation of cash crops also increased. In our case the past experience of conflict and a fear of communal violence igniting in the future raise the probability of mixed crop production. Our apparently anomalous results, with respect to increasing risk-taking in cropping patterns following greater subjective feelings of violent experiences, can only be explained by less well known theories about risky behaviour. Conventional wisdom would suggest that individuals become more risk averse after an adverse shock, such as conflict and the fear of violence. This is also the prediction of expected utility theory in conjunction with the concavity property of standard utility functions leading to the properties of diminishing marginal utility of income, as well as absolute risk aversion. The standard precepts of expected utility do not, however, hold in many contexts. In our case, we can argue that both experience and subjective perceptions of violence amount to 'trauma', which has a pecuniary counterpart that may be characterized as one where the concerned individual or household has sustained a financial loss. Markowitz (1952) indicated that starting from a state of loss, individuals are wont to engage in more risk-taking to regain their previous valued position, than when their wealth portfolio is exhibiting positive growth and their expectations are over-fulfilled. Secondly, he also pointed out that what may matter more for decisions to engage in risky projects is the distribution of possible profit or loss it may entail, rather than the absolute (expected) value of risky prospect. In other words, the *direction* of *change* in the household's asset position and the possibility of regaining a highly valued asset in monetary or social terms are more salient than its level in our case.

Following Kahneman and Tversky (1979) we may apply prospect theory to explain our empirical findings with regard to cropping patterns, bearing in mind that cash crop cultivation is more risky, as it does not guarantee the household's subsistence and is more subject to market fluctuations. Prospect theory represents a departure from expected utility in that it is a two stage process, and risky ventures are weighted not just by (subjective) probability of the different risky states, but by a more complicated 'decision weighting' process. The first stage of the decision involves an editing phase where a reference point is chosen to evaluate the likely effect of the actual risky investment framed in terms of specific aspects of the highly valued by the decision maker. This is akin to the framing decisions currently emphasized by behavioural economists, and individual self-image stated much earlier by Boulding (1956). Following the trauma of eviction and/or violence, individuals may feel that the key value of assets have diminished and must be replaced as a priority. In the second stage of evaluation,

when the household decides on its type of crop cultivation, it may take more risks, if the risky project has a high enough decision weight compared to the less risky alternative. Decision weighting is related to the probability of an uncertain project bearing fruition, but it also includes the subjective desirability of the outcome, a property that alters less readily in the mind than the pure probability of success. The point being that taking on more risks is understandable if there is a substantial chance that more risky investments will lead to recuperation of particular erstwhile losses. This may explain why households with a greater past experience of violence (and in some cases a fear of future conflict) are more likely to invest in the more risky cash crops along with food crops.[2] Moreover, prospect theory also suggests that the decision weight given to a desirable outcome may be greater than its objective probability in the expected utility framework. In other words, individuals overweight the likelihood of a more desirable outcome.

Our results also have qualitatively similarities to the findings of Voors et al. (2011) in their field experiment in post-conflict Burundi who observe greater risk-taking and trust after conflict. While we only have data on trust for the survey period, and are unable to infer any increase in trust, social capital in the form of trust could have a possible role in determining livelihood decisions, which in our case is insignificant with regard to cropping choices. In our case, the application of prospect theory to individual decision-making by households appears more salient when it comes to production (cropping) decisions, as it seems better at explaining household risk-taking. Our earlier results about consumption, however, indicate that social capital is statistically relevant when interacted with actual experiences of violence. When individuals reduce consumption they invest more (including in agricultural production). Thus, trust may still influence overall investment choices even if it does not significantly influence its composition and risk-taking behaviour.

## 5        Conclusions

Our object has been to analyse household livelihood decision-making processes under the shadow of violence in the post-conflict Chittagong Hill tracts region of Bangladesh. As with other developing country internal conflicts, the accord ending the insurgency is imperfect in nature, and the central grievance concerning land encroachment is yet to be addressed. Violence between settlers who have encroached on the land of the ethnically distinct local population is still prevalent, and the Bangladesh army is still present in the region in substantial numbers to deal with any potential insurgency. Land, in the context of the densely populated and agriculturally dependent country, is the principal bone of contention. Thus, neo-Malthusian factors play a role in this conflict, as the shortage of land necessitates encroachment by settlers, which along with grievances induced by land grabbing and threats to the distinct way of life of the indigenous people produces conflict.

The main innovation of the analysis is the incorporation of psycho-social factors, specifically the trauma of past violence and also current perceptions of the likelihood of future conflict

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[2] Following Kahneman and Tversky (1979), let the value ($V$) of the household's risky prospect be: $V(x, y, p, L) = v(y) = \pi(p, L)[v(x) - v(y)]; \cdots or, \pi(p, L)v(x) + [1 - \pi(p, L)]v(y) \cdots \pi_1, \pi_2 > 0.$ Here $v(x)$ is the value of the risky project; $v(y)$ is the value of the less risky project; $p$ refers to the probability of success of $x$, $\pi$ is the decision weight which is a positive function of both the probability of success, and losses ($L$) previously sustained. It is immediately apparent that an increase in losses due to perceptions of violence will raise the attractiveness of the risky project by weighing the decision weight more heavily in favour of $x$.

into the analysis of economic decision-making. We also include some information on trust between the different identities that make up the indigenous group in the region. In that sense we endogenize preferences with regard to consumption, cropping and the decision to school children to these phenomena, in line with the tenets of current behavioural economics, and earlier work on the individual's self image. Our research suggests that under certain circumstances heightened subjective perceptions about violence reigniting in the future, as well as past experiences of conflict, may lower consumption expenditure as a risk-reducing tactic while also increasing the propensity to send children to school and risky mixed crop cultivation. Consumption appears to decline both with the experience of past conflict and its future expectation, but rises when eviction or land dispossession is involved. Previous experiences of land dispossession raise the propensity to school children. Past experiences of conflict and current fears of communal violence between the settler and indigenous communities increase the likelihood of more risky mixed cropping production decisions.

The endogenous determination of preferences is one aspect of the explanation for the phenomena we are observing. It cannot by itself adequately explain greater risk-taking. We go on to discover that certain types of risky behaviour are best explained by prospect theory, which under certain circumstances predicts a certain degree of risk-taking as a response to loss. Conflict (experienced or anticipated) may make some people bolder and more likely to take risks in order to enhance their long-term future. Prospect theory is apposite in understanding this reaction, as people frame their decisions in the light of personal priorities that dominate the expected objective value of greater risk-taking.

Our results do suggest the possibility of a post-conflict Phoenix or rapid economic recovery factor at the household level. Its presence or absence has a lot to do with individual household behaviour and the manner in which past experiences of violence and current perceptions about future conflict are processed in the mind. If they make individuals bolder so they aim at recovering past losses, or local institutional settings induce a preference for greater investment, a Phoenix factor may ensue, and rapid growth may follow. Ultimately, it depends on confidence, where local factors in decision-making are salient, but a lot will still depend on the macro political and economic framework for large-scale recovery to take place.

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# Appendix 1: Data and Estimation Tables

Annex Table 1: Descriptive statistics on livelihood status by perception and experience of violence

| Perception and experience of Violence | Decision-making: Livelihood Indicator (Mean Value) | | | | |
|---|---|---|---|---|---|
| | Consumption Expenditure (in Tk.) | | | Investment: Children Enrollment (in %) | Production: Mixed Crop (in %) |
| | All | Food consumption | Non-food Consumption | | |
| Perception of violence | | | | | |
| Armed conflict | 10627.15 (3450.50) | 9964.126 (3350.25) | 663.0242 (335.36) | 45.48 | 58.19 |
| Communal violence | 11805.74 (4240.55) | 11093.12 (4066.36) | 712.6249 (383.97) | 46.52 | 56.89 |
| Fear of eviction from land | 11890.93 (4351.64) | 11153.32 (4164.82) | 737.6055 (396.17) | 46.11 | 57.31 |
| Pre-peace accord experience of violence | | | | | |
| Displacement | 11744.86 (4286.43) | 10989.15 (4119.99) | 755.72 (425.45) | 44.18 | 53.15 |
| Land dispossession | 11736.72 (3859.19) | 10963.7 (3707.27) | 773.01 (432.25) | 48.11 | 50.24 |
| Armed conflict | 11408.18 (4198.26) | 10716.76 (4024.87) | 691.42 (355.88) | 43.30 | 54.56 |
| Note: Standard errors are in parenthesis. | | | | | |

Source: authors' estimation.

Annex Table 2: Summary of variables included in regression model

| Endogenous Variable | Variable Name | Consumption Decision Equation: Consumption expenditure | Investment Decision Equation: Child enrolment | Production Decision Equation: Type of crops produced |
|---|---|---|---|---|
| Per capita annual consumption expenditure | lnpcyexp | LHS | | |
| Per capita annual food consumption expenditure | lnpcyexf | | | |
| Per capita annual non-food consumption expenditure | lnpcyexnf | | | |
| Child enrollment in primary and secondary school | enroll_child | | LHS | |

| Type of crops produced | croptype3 | | | LHS |
|---|---|---|---|---|
| Exogenous variables | | | | |
| Household size | hhsize | √ | √ | √ |
| Age of household head | age_hhhead | √ | √ | √ |
| Sex of household head | sex_hhhead | √ | √ | √ |
| HH head never attended school* | edu_hhhead1 | √ | √ | √ |
| HH head completed primary school | edu_hhhead2 | √ | √ | √ |
| HH head completed secondary School | edu_hhhead3 | √ | √ | √ |
| HH head completed above secondary School | edu_hhhead4 | √ | √ | √ |
| Age of child | agechild | | √ | |
| Age square of child | agesq_child | | √ | |
| Sex of child | sexchild | | √ | |
| Government school | schol_type1 | | √ | |
| NGO school | schol_type2 | | √ | |
| Private school | schol_type3 | | √ | |
| Other type of school* | schol_type4 | | √ | |
| Language of book (mother tongue=1) | booklanguage | | √ | |
| Medium of instruction in school (mother tongue=1) | teachinglanguage | | √ | |
| Per capita HH asset | pc_asset | √ | √ | |
| HH electrification status | hhelectrification | √ | | |
| Plough cultivation* | type_cultivation1 | | | √ |
| Jum cultivation | type_cultivation2 | | | √ |
| Both Jum and plough cultivation | type_cultivation3 | | | √ |
| Amount of land cultivated | lncult_land | | | √ |

| Social Capital (trust) | q1707 | √ | | √ | | √ | |
|---|---|---|---|---|---|---|---|
| Perception of violence | | | | | | | |
| Armed conflict | dq1709_4b | √ | | √ | | √ | |
| Communal violence | dq1709_5b | √ | | √ | | √ | |
| Fear of eviction from land | dq1709_11b | √ | | √ | | √ | |
| Pre-peace accord experience of violence | | | | | | | |
| Displacement | displacement | √ | | √ | | √ | |
| Land dispossession | landdispossession | √ | | √ | | √ | |
| Armed conflict | pastarmedconflict | √ | | √ | | √ | |

Notes: LHS indicates that a variable is included as endogenous variable in the left-hand-side of the equation. '√' indicates that a variable is included as exogenous variable.  * Denotes reference category.

Source: authors' estimation.

Annex Table 3: Determinant of consumption expenditure (specification1): OLS and 2SLS estimation

| Independent Variable | Dependent Variable | | | | | |
|---|---|---|---|---|---|---|
| | All consumption expenditure | | Food consumption expenditure | | Non-food consumption expenditure | |
| | OLS | 2SLS | OLS | 2SLS | OLS | 2SLS |
| Household size | -0.0468*** | -0.0521*** | -0.0432*** | -0.0514*** | -0.0895*** | -0.957 |
| | (0.0046) | (0.0110) | (0.0048) | (0.0117) | (0.0055) | (103.0) |
| Per capita asset | 5.61e-06*** | 5.11e-06*** | 5.69e-06*** | 5.21e-06*** | 4.10e-06*** | -0.0003 |
| | (5.32e-07) | (7.49e-07) | (5.41e-07) | (7.71e-07) | (7.43e-07) | (0.0369) |
| Age of household head | -0.0004 | -0.0007 | -0.0006 | -0.0011 | 0.0005 | -0.279 |
| | (0.0005) | (0.0009) | (0.0006) | (0.0010) | (0.0007) | (33.23) |
| Sex of household head; Male | 0.0152 | 0.0301 | 0.0190 | 0.0430 | 0.0039 | -5.790 |
| | (0.0170) | (0.0357) | (0.0180) | (0.0394) | (0.0217) | (689.6) |
| Educational status of household head | | | | | | |
| Primary completed | -0.0055 | -0.0120 | -0.0029 | -0.0096 | -0.0343 | 5.109 |
| | (0.0196) | (0.0240) | (0.0204) | (0.0274) | (0.0242) | (612.6) |
| Secondary completed | 0.0134 | 0.0169 | 0.0138 | 0.0134 | 0.0097 | -1.198 |
| | (0.0199) | (0.0291) | (0.0206) | (0.0317) | (0.0271) | (144.6) |
| Above secondary | -0.0639 | -0.120 | -0.0725 | -0.163 | 0.0446 | -3.052 |
| | (0.0604) | (0.140) | (0.0632) | (0.154) | (0.0850) | (368.6) |
| Household electrified | 0.0137 | 0.0147 | 0.0152 | 0.0197 | 0.0169 | 1.836 |
| | (0.0196) | (0.0275) | (0.0203) | (0.0306) | (0.0263) | (216.8) |
| Enrollment of children: Enrolled | -0.0117 | -0.0087 | -0.0103 | -0.0038 | -0.0391** | -0.757 |
| | (0.0159) | (0.0221) | (0.0168) | (0.0249) | (0.0198) | (85.33) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Log amount of cultivated land | -0.0152** | 0.0077 | -0.0134* | 0.0207 | -0.0288*** | 4.086 |
| | (0.0072) | (0.0396) | (0.0075) | (0.0420) | (0.0098) | (489.0) |
| Current perception of violence | | | | | | |
| Fear of armed conflict | -0.107*** | -0.593 | -0.104*** | -0.620 | -0.128*** | 68.52 |
| | (0.0217) | (0.417) | (0.0224) | (0.443) | (0.0260) | (8,204) |
| Fear of communal violence | 0.0260 | 0.328 | 0.0343* | 0.514 | -0.0798*** | -153.8 |
| | (0.0200) | (0.572) | (0.0207) | (0.614) | (0.0258) | (18,296) |
| Fear of eviction from own land | 0.0468** | -0.112 | 0.0458** | -0.335 | 0.0620** | -34.35 |
| | (0.0209) | (0.740) | (0.0217) | (0.785) | (0.0267) | (4,108) |
| Observations | 1,692 | 1,692 | 1,692 | 1,692 | 1,692 | 1,692 |
| Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1 | | | | | | |

Source: authors' estimation.

Annex Table 4: Joint test of significance (Specification 1): OLS Estimation

```
. test  p_armedconflict p_communalthreat p_evictedland

 ( 1)  p_armedconflict = 0
 ( 2)  p_communalthreat = 0
 ( 3)  p_evictedland = 0

      F(  3,  1678) =     8.53
           Prob > F =    0.0000
. test  p_armedconflict p_communalthreat p_evictedland

 ( 1)  p_armedconflict = 0
 ( 2)  p_communalthreat = 0
 ( 3)  p_evictedland = 0

      F(  3,  1678) =     8.06
           Prob > F =    0.0000
```

```
. test  p_armedconflict p_communalthreat p_evictedland

 ( 1)  p_armedconflict = 0
 ( 2)  p_communalthreat = 0
 ( 3)  p_evictedland = 0

      F(  3,  1678) =    14.61
           Prob > F =    0.0000
```

Source: authors' estimation.

Annex Table 5: Alternative Hausman Test for all consumption expenditure in specification 1

```
.  hausman ivols ols

Note:  the rank of the differenced variance matrix (9) does not equal  the number
       of coefficients being tested (10); be sure this is what you expect, or
       there may be problems computing the test.  Examine the output of your
       estimators for anything unexpected and possibly consider scaling your
       variables so that the coefficients are on a similar scale.

                   ———— Coefficients ————
                     (b)          (B)           (b-B)       sqrt(diag(V_b-V_B))
                     ivols        ols          Difference          S.E.
    ───────────────────────────────────────────────────────────────────────────
        hhsize      -.052085     -.0462947     -.0057903          .0100828
       pc_asset      5.11e-06      5.66e-06     -5.42e-07          5.54e-07
     age_hhhead     -.0007848    -.0004777     -.0003071          .0007344
     sex_hhhead      .0301213      .0143283      .015793           .0311628
     edu_hhhead2    -.0120051     -.002531      -.0094741          .0135519
     edu_hhhead3     .016873       .0117253      .0051477          .0197227
     edu_hhhead4    -.1196578     -.0647634     -.0548944          .1234914
    hhelectrif~n     .0147052      .0160621     -.0013569          .0176463
    enroll_child    -.0087152     -.0111826      .0024674          .0151804
     lncult_land     .0076988     -.0166715      .0243703          .0388379
    ───────────────────────────────────────────────────────────────────────────
                         b = consistent under Ho and Ha; obtained from ivreg
             B = inconsistent under Ha, efficient under Ho; obtained from regress

       Test:  Ho:   difference in coefficients not systematic

              chi2(9) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =          1.52
              Prob>chi2 =        0.9970
.
```

Source: authors' estimation.

Annex Table 6: Alternative Hausman Test for food consumption in specification 1

```
. hausman ivols ols

Note:  the rank of the differenced variance matrix (12) does not equal  the
       number of coefficients being tested (13); be sure this is what you
       expect, or there may be problems computing the test.  Examine the
       output of your estimators for anything unexpected and possibly consider
       scaling your variables so that the coefficients are on a similar scale.
```

| | ——— Coefficients ——— | | | |
|---|---|---|---|---|
| | (b) | (B) | (b-B) | sqrt(diag(V_b-V_B)) |
| | ivols | ols | Difference | S.E. |
| p_armedcon~t | -.6198072 | -.1038199 | -.5159873 | .4772124 |
| p_communal~t | .5135234 | .0343032 | .4792202 | .6559354 |
| p_evictedl~d | -.3350538 | .0457799 | -.3808337 | .8483026 |
| hhsize | -.0514077 | -.0432245 | -.0081832 | .0117456 |
| pc_asset | 5.21e-06 | 5.69e-06 | -4.74e-07 | 6.78e-07 |
| age_hhhead | -.0010595 | -.0005789 | -.0004806 | .0008932 |
| sex_hhhead | .0429912 | .019012 | .0239792 | .0366845 |
| edu_hhhead2 | -.0096889 | -.0029383 | -.0067506 | .0181661 |
| edu_hhhead3 | .0134052 | .0137538 | -.0003486 | .0248032 |
| edu_hhhead4 | -.1634474 | -.0724941 | -.0909534 | .145121 |
| hhelectrif~n | .0197068 | .0151818 | .004525 | .0226121 |
| enroll_child | -.0038318 | -.0103144 | .0064825 | .0190167 |
| lncult_land | .02075 | -.0134343 | .0341843 | .044675 |

```
                       b = consistent under Ho and Ha; obtained from ivreg
            B = inconsistent under Ha, efficient under Ho; obtained from regress

     Test:  Ho:   difference in coefficients not systematic

           chi2(12) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                    =              1.30
           Prob>chi2 =         0.9999
```

.

Source: authors' estimation.

Annex Table 7: Alternative Hausman Test for non-food consumption in specification 1

```
. estimates store ivols

. hausman ivols ols

Note:  the rank of the differenced variance matrix (12) does not equal the
       number of coefficients being tested (13); be sure this is what you
       expect, or there may be problems computing the test.  Examine the
       output of your estimators for anything unexpected and possibly consider
       scaling your variables so that the coefficients are on a similar scale.
```

| | ——— Coefficients ——— | | | |
| | (b) ivols | (B) ols | (b-B) Difference | sqrt(diag(V_b-V_B)) S.E. |
|---|---|---|---|---|
| p_armedcon~t | -.2188862 | -.1281094 | -.0907767 | .7672077 |
| p_communal~t | -.4136797 | -.0798116 | -.3338681 | .6089152 |
| p_evictedl~d | .2184835 | .0619637 | .1565198 | .3021862 |
| hhsize | -.0897747 | -.0895312 | -.0002435 | .0073946 |
| pc_asset | 3.32e-06 | 4.10e-06 | -7.79e-07 | 1.20e-06 |
| age_hhhead | .0000894 | .0004647 | -.0003753 | .0009558 |
| sex_hhhead | -.0099314 | .0039469 | -.0138783 | .0273433 |
| edu_hhhead2 | -.028767 | -.0342885 | .0055215 | .0208098 |
| edu_hhhead3 | .0145651 | .0097556 | .0048095 | .0146002 |
| edu_hhhead4 | .0580101 | .0446022 | .0134079 | .077669 |
| hhelectrif~n | .0158622 | .0169221 | -.0010599 | .0120971 |
| enroll_child | -.0433993 | -.0390523 | -.0043469 | .0089563 |
| lncult_land | -.0255861 | -.0287989 | .0032128 | .0314799 |

```
                        b = consistent under Ho and Ha; obtained from ivreg
           B = inconsistent under Ha, efficient under Ho; obtained from regress

    Test:  Ho:   difference in coefficients not systematic

           chi2(12) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                    =           1.13
           Prob>chi2 =         1.0000

.
```

Source: authors' estimation.

Annex Table 8: Determinant of Consumption Expenditure (Specification 2): OLS Estimation

| Independent Variable | Dependent Variable | | |
|---|---|---|---|
| | All consumption expenditure | Food consumption expenditure | Non-food consumption expenditure |
| Household size | -0.0479***(0.0047) | -0.0442***(0.0049) | -0.0919***(0.00543) |
| Per capita asset | 5.50e-06***(5.42e-07) | 5.55e-06***(5.49e-07) | 4.27e-06***(7.48e-07) |
| Age of household head | -0.0005 (0.0005) | -0.0006 (0.0005) | 0.0005 (0.0007) |
| Sex of household head; Male | 0.0135 (0.0172) | 0.0170 (0.0183) | 0.0072 (0.0218) |
| Educational status of household head | | | |
| Primary completed | -0.0033 (0.0198) | -0.0008 (0.0206) | -0.0311(0.0243) |
| Secondary completed | 0.0114 (0.0200) | 0.0114 (0.0207) | 0.0125 (0.0268) |
| Above secondary | -0.0614 (0.0579) | -0.0694 (0.0604) | 0.0376 (0.0858) |
| Household electrified | 0.0138 (0.0197) | 0.0156 (0.0204) | 0.0138 (0.0264) |
| Enrolment of children: Enrolled | -0.0105(0.0160) | -0.00920(0.0168) | -0.0378* (0.0198) |
| Log amount of cultivated land | -0.0162** (0.0072) | -0.0143* (0.0075) | -0.0305*** (0.0096) |
| Social capital | | | |
| Good relation among indigenous community (Trust) | -0.0197 (0.0261) | -0.0180 (0.0270) | -0.0452 (0.0388) |
| Previous experience of violence | | | |
| Displacement from own home | -0.0559**(0.0254) | -0.0609**(0.0265) | 0.0129 (0.0300) |
| Land dispossession | 0.000667 (0.0177) | -0.00470(0.0184) | 0.0635** (0.0258) |
| Armed conflict | -0.0394** (0.0178) | -0.0313*(0.0184) | -0.133*** (0.0253) |
| Constant | 9.630*** (0.0600) | 9.532*** (0.0639) | 7.127*** (0.0790) |
| Observations | 1,692 | 1,692 | 1,692 |
| Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1 | | | |

Source: authors' estimation.

Annex Table 9: Joint test of significance (Specification 2): OLS Estimation

```
. test  displacement landdispossesion pastarmedconflict

 ( 1)  displacement = 0
 ( 2)  landdispossesion = 0
 ( 3)  pastarmedconflict = 0

       F(  3,  1677) =     4.22
            Prob > F =    0.0055
```

```
. test  displacement landdispossesion pastarmedconflict

 ( 1)  displacement = 0
 ( 2)  landdispossesion = 0
 ( 3)  pastarmedconflict = 0

       F(  3,  1677) =     3.68
            Prob > F =    0.0117
```

```
. test  displacement landdispossesion pastarmedconflict

 ( 1)  displacement = 0
 ( 2)  landdispossesion = 0
 ( 3)  pastarmedconflict = 0

       F(  3,  1677) =    11.01
            Prob > F =    0.0000
```

Source: authors' estimation.

Annex Table 10: Determinant of Consumption Expenditure (Specification3): OLS Estimation

| Independent Variable | Dependent Variable | | |
|---|---|---|---|
| | All consumption expenditure | Food consumption expenditure | Non-food consumption expenditure |
| Household size | -0.0480***(0.00471) | -0.0443***(0.00492) | -0.0925***(0.00546) |
| Per capita asset | 5.50e-06***(5.41e-07) | 5.56e-06***(5.48e-07) | 4.27e-06***(7.48e-07) |
| Age of household head | -0.000529(0.000570) | -0.000632(0.000592) | 0.000455(0.000737) |
| Sex of household head; Male | 0.0126(0.0172) | 0.0161(0.0183) | 0.00709(0.0218) |
| Educational status of household head | | | |
| Primary completed | -0.00540(0.0198) | -0.00325(0.0206) | -0.0289 (0.0243) |
| Secondary completed | 0.0122(0.0200) | 0.0120(0.0207) | 0.0152 (0.0269) |
| Above secondary | -0.0634(0.0584) | -0.0718(0.0609) | 0.0429 (0.0865) |
| Household electrified | 0.0138(0.0198) | 0.0158(0.0206) | 0.00998 (0.0263) |
| Enrolment of children: Enrolled | -0.0102(0.0160) | -0.00868(0.0168) | -0.0395**(0.0198) |
| Log amount of cultivated land | -0.0163**(0.00724) | -0.0144*(0.00758) | -0.0309***(0.00966) |
| Social capital | | | |
| Good relation among indigenous community | -0.0772**(0.0348) | -0.0772**(0.0360) | -0.0685(0.0504) |
| Previous experience of violence | | | |
| Displacement from own home | -0.0361(0.0665) | -0.0332(0.0683) | -0.00682(0.0952) |
| Land dispossession | -0.0741(0.0521) | -0.0717(0.0539) | -0.128(0.0927) |
| Armed conflict | -0.149***(0.0559) | -0.157***(0.0568) | -0.00779(0.0841) |
| Interaction between previous experience of violence and social capital | | | |
| Displacement*Trust | -0.0195(0.0714) | -0.0280(0.0734) | 0.0227(0.100) |
| Dispossession* Trust | 0.0843(0.0554) | 0.0757(0.0573) | 0.211**(0.0965) |
| Armed conflict* Trust | 0.122**(0.0590) | 0.140**(0.0600) | -0.137(0.0881) |
| Constant | 9.683***(0.0636) | 9.587***(0.0671) | 7.155***(0.0878) |
| Observations | 1,692 | 1,692 | 1,692 |
| Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$ | | | |

Source: authors' estimation.

Annex Table 11: Determinants of Child Enrolment; Specification 1

| Independent variable | Regression model for Child Enrollment | | |
|---|---|---|---|
| | LPM | Logit; marginal effect | Probit; marginal effect |
| Age of child | 0.104*** (0.00639) | 0.1355*** (0.0098) | 0.1275*** (0.0089) |
| Age square of child | -0.00351*** (0.0004) | -0.0048*** (0.0005) | -0.0045*** (0.0005) |
| Sex of child; Male | -0.0346* (0.0199) | -0.0490* (0.0261) | -0.0541** (0.0238) |
| Age of household head | 0.0008 (0.0006) | 0.0011 (0.0008) | 0.0009 (0.0008) |
| Sex of household head; Male | 0.0120 (0.0185) | 0.0166 (0.0243) | 0.0165 (0.0232) |
| Educational status of household head: no education as reference category | | | |
| Primary completed | 0.0284 (0.0210) | 0.0357 (0.0279) | 0.0312 (0.0265) |
| Secondary completed | -0.0132 (0.0230) | -0.0155 (-0.0299) | -0.0146 (0.0287) |
| Above secondary | -0.114 (0.0815) | -0.1574 (0.0958) | -0.1592 (0.0915) |
| Type of educational institutions: other types of school as reference category | | | |
| Government School | 0.104*** (0.0200) | 0.1341*** (0.0257) | 0.1287*** (0.0244) |
| Non-government private school | 0.119*** (0.0262) | 0.1557*** (0.0343) | 0.1488*** (0.0333) |
| NGO school | -0.0205 (0.0595) | -0.0251 (0.0728) | -0.0294 (0.0703) |
| Language of book; Mother Tongue | 0.275* (0.141) | 0.3638* (0.1936) | 0.3600** (0.1790) |
| Medium of instruction; Mother Tongue | -0.309** (0.140) | -0.3574** (0.1499) | -0.3635** (0.1447) |
| Household size | 0.0027 (0.0046) | 0.0034 (0.0060) | 0.0031 (0.0057) |
| Per capita asset | 5.65e-07 (4.67e-07) | 7.51e-07 (0.0000) | 7.67e-07 (0.0000) |
| Current perception of violence | | | |
| Fear of armed conflict | -0.0039 (0.0248) | -0.0065 (0.0327) | -0.0071 (0.0314) |
| Fear of communal violence | -0.0183 (0.0213) | -0.0227 (0.0278) | -0.0208 (0.0268) |
| Fear of eviction from own land | 0.0074 (0.0211) | 0.0087 (0.0277) | 0.0071 (0.0265) |
| Observations | 2,583 | 2,583 | 2,583 |
| Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1 | | | |

Source: authors' estimation.

Annex Table 12: Determinants of Enrolment; Specification 2

| Independent variable | Regression Model for Child Enrollment | | |
|---|---|---|---|
| | LPM | Logit; marginal effect | Probit; marginal effect |
| Age of child | 0.104*** (0.0064) | 0.1354*** (0.0098) | 0.1273*** (0.0089) |
| Age square of child | -0.0035*** (0.0004) | -0.0048*** (0.0005) | -0.0045*** (0.0005) |
| Sex of child; Male | -0.0341*(0.0199) | -0.0490* (0.0262) | -0.0537** (0.0238) |
| Age of household head | 0.0008 (0.0007) | 0.0011 (0.0008) | 0.0009 (0.0008) |
| Sex of household head; Male | 0.0132 (0.0186) | 0.0178 (0.0244) | 0.0177 (0.0233) |
| Educational status of household head: no education as reference category | | | |
| Primary completed | 0.0280 (0.0210) | 0.0348 (0.0281) | 0.0307 (0.0266) |
| Secondary completed | -0.0124 (0.0230) | -0.0146 (0.0302) | -0.0139 (0.0288) |
| Above secondary | -0.116 (0.0822) | -0.1599* (0.0968) | -0.1605* (0.0920) |
| Type of educational institutions: other types of school as reference category | | | |
| Government School | 0.103*** (0.0200) | 0.1332*** (0.0258) | 0.1278*** (0.02458) |
| Non-government private school | 0.119*** (0.0262) | 0.1578*** (0.0344) | 0.1511*** (0.0333) |
| NGO school | -0.0179 (0.0593) | -0.0238 (0.0735) | -0.0278 (0.0708) |
| Language of book; Mother Tongue | 0.289** (0.140) | 0.3741** (0.1813) | 0.3684** (0.1726) |
| Medium of instruction; Mother Tongue | -0.321** (0.139) | -0.3642*** (0.1403) | -0.3689*** (0.1394) |
| Household size | 0.00183 (0.00467) | 0.0022 (0.0061) | 0.0021 (0.0058) |
| Per capita asset | 6.58e-07 (4.67e-07) | 8.84e-07 (0.0000) | 8.80e-07 (0.0000) |
| Social capital | | | |
| Good relation among indigenous community | -0.0129 (0.0306) | -0.0166 (0.0406) | -0.0128 (0.039) |
| Previous experience of violence | | | |
| Displacement from own home | -0.0066 (0.0282) | -0.0075 (0.0366) | -0.0073 (0.0346) |
| Land dispossession | 0.0522** (0.0227) | 0.0701** (0.0301) | 0.0676** (0.0282) |
| Armed conflict | 0.0015 (0.0218) | 0.0024 (0.0283) | 0.0025 (0.0271) |
| Observations | 2,583 | 2,583 | 2,583 |
| Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1 | | | |

Source: authors' estimation.

Annex Table 13: Joint Test for Significance: Specification 2; Child Enrollment

```
. test  displacement    landdispossesion

 ( 1)  [enroll_child]displacement = 0
 ( 2)  [enroll_child]landdispossesion = 0

         chi2(  2) =      6.02
        Prob > chi2 =      0.0493
. test   pastarmedconflict landdispossesion

 ( 1)  [enroll_child]pastarmedconflict = 0
 ( 2)  [enroll_child]landdispossesion = 0

         chi2(  2) =      5.79
        Prob > chi2 =      0.0553
```

Source: authors' estimation.

Annex Table 14: Determinants of Enrolment; Specification 3

| Independent variable | Probit Model for Child Enrollment: Interaction Term |
|---|---|
| | Probit; marginal effect |
| Age of child | 0.1270*** (0.0089) |
| Age square of child | -0.0045*** (0.0049) |
| Sex of child; Male | -0.0539** (0.0238) |
| Age of household head | 0.0009 (0.0008) |
| Sex of household head; Male | 0.0181 (0.0233) |
| Educational status of household head: no education as reference category | |
| Primary completed | 0.0317 (0.0267) |
| Secondary completed | -0.0136 (0.0288) |
| Above secondary | -0.1589** (0.0923) |
| Type of educational institutions: other types of school as reference category | |
| Government School | 0.1275*** 0.0245 |
| Non-government private school | 0.1518*** 0.0333 |
| NGO school | -0.0294 (0.0706) |
| Language of book; Mother Tongue | 0.3815*** (0.1752) |
| Medium of instruction; Mother Tongue | -0.3803** (0.1404) |
| Household size | 0.0018 (0.0058) |
| Per capita asset | 8.80e-07 (0.0000) |
| Previous experience of violence | |
| Displacement from own home | -0.0731 (0.1148) |
| Land Dispossession | 0.0661 (0.0968) |
| Armed conflict | 0.0713 (0.1250) |
| Social Capital | |
| Good relation among indigenous communities | 0.0088 (0.0493) |
| Interaction between previous experience of violence and social capital | |
| Displacement*Trust | 0.0713 (0.1250) |
| Dispossession* Trust | 0.0013 (0.1002) |
| Armed conflict* Trust | -0.1095 (0.0837) |
| Observations | 2,583 |
| Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1 | |

Source: authors' estimation.

Annex Table 15: Determinants of production decision of mixed crop: Probit and IV Probit

| Explanatory Variables | Specification 1: Perception of violence | | Specification 2: Experience of violence | Specification 3: Interaction term |
|---|---|---|---|---|
| | Probit, Marginal Effect | IV Probit, Marginal Effect | Probit, Marginal Effect | Probit, Marginal Effect |
| Household size | 0.0048 (0.0079) | 0.01701 (0.0276) | 0.0042   (0.0079) | 0.0048 (0.0079) |
| Per capita asset | -9.93e-07 (0.00) | -2.21e-06 (0.00) | -1.26e-06   (0.00) | -1.24e-06 (0.00) |
| Age of household head | 0.0006 (0.0012) | 0.0017 (0.0029) | 0.0005   (0.0012) | 0.0004  (.0012) |
| Sex of household head; male | -0.0288 (0.0326) | -0.0602 (0.1027) | -0.0345   (0.0326) | -0.0352 (0.0327) |
| Educational status of household head; no education as reference category | | | | |
| Primary completed | -0.1328 (0.1223) | -0.2975 (0.3761) | -0.1503   (0.1232) | -0.1477 (0.1237) |
| Secondary completed | -0.1107 (0.1265) | -0.2317  (0.3920) | -0.1291   (0.1274) | -0.1288 (0.128) |
| Above secondary | -0.0437 (0 .1276) | -0.0789  (0.3549) | -0.0613   (0.1292) | -0.0605 (0.129) |
| Log amount of cultivated land | 0.216*** (0.017) | 0.5393***   (0.086) | 0.2181*** (0.0171) | 0.218*** (0.017) |
| Social capital | | | | |
| Good relation among indigenous community | - | - | 0.0047*   (0.0504) | -0.0201 (0.063) |
| Type of cultivation: plough cultivation as reference category | | | | |
| Jum Cultivation | 0.0731** (0.0334) | 0.1488  (0.1889) | 0.0776 (0.0332) | 0.0755** (0.0337) |
| Both Plough and Jum Cultivation | -0.0158 (0.0485) | 0.0125  (0.2523) | -0.0546** (0.0479) | -0.0580 (0.0482) |
| Current perception of violence | | | | |
| Fear of armed conflict | -0.0036 (0.0447) | -0.1424 (0.5615) | - | - |
| Fear of communal violence | 0.1405*** (0.041) | 0.8712 (2.0963) | - | - |
| Fear of eviction from own land | 0.0031 (0.0432) | -0.2452 (1.0659) | - | - |
| Previous experience of violence | | | | |
| Displacement | - | - | -0.01566 (0.0433) | 0.0857  (0.1505) |
| Land dispossession | - | - | -0.0532 (0.0357) | -0.0679 (0.1107) |

| Armed conflict | - | - | 0.0789** (0.0388) | -0.0677 (0.1260) |
|---|---|---|---|---|
| Interaction between previous experience of violence and social capital | | | | |
| Displacement* Good relation | - | - | - | -0.1105 (0.1637) |
| Land dispossession* Good relation | - | - | - | 0.0161 (0.1155) |
| Armed conflict* Good relation | - | - | - | 0.1565 (0.1214) |
| Number of observations | 1,285 | 1,285 | 1,285 | 1,285 |
| Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1 | | | | |

Source: authors' estimation.

Annex Table 16: Joint test of significance: probit estimation for perception of violence

```
. test  p_armedconflict p_communalthreat p_evictedland

 ( 1)   [croptype3]p_armedconflict = 0
 ( 2)   [croptype3]p_communalthreat = 0
 ( 3)   [croptype3]p_evictedland = 0

        chi2(  3) =    18.95
      Prob > chi2 =     0.0003
```
Source: authors' estimation.

Annex Table 17: Joint test of significance: Probit estimation for experience of violence

```
. test  landdispossesion pastarmedconflict

 ( 1)   [croptype3]landdispossesion = 0
 ( 2)   [croptype3]pastarmedconflict = 0

        chi2(  2) =     5.99
      Prob > chi2 =     0.0499
```
Source: authors' estimation.

Annex Table 18: Robustness of Probit estimation for specification 1

| Independent Variables | Dependent Variable: Mixed crops | | |
|---|---|---|---|
| | LPM | Logit | Probit |
| Household size | 0.00445 (0.00696) | 0.0217 (0.0338) | 0.0123 (0.0203) |
| Per capita asset | -6.86e-07** (3.30e-07) | -5.17e-06 (3.67e-06) | -2.52e-06 (1.99e-06) |
| Age of household head | 0.000683 (0.000994) | 0.00340 (0.00488) | 0.00166 (0.00293) |
| Sex of household head; male | -0.0240 (0.0276) | -0.145 (0.139) | -0.0733 (0.0832) |
| Educational status of household head; no education as reference category | | | |
| Primary completed | -0.129 (0.104) | -0.618 (0.491) | -0.339 (0.316) |
| Secondary completed | -0.107 (0.106) | -0.503 (0.497) | -0.280 (0.319) |
| Above secondary | -0.0518 (0.106) | -0.214 (0.502) | -0.110 (0.322) |
| Log amount of cultivated land | 0.186*** | 0.932*** (0.0808) | 0.548*** (0.0444) |
| Type of cultivation: plough cultivation as reference category | | | |
| Jum Cultivation | 0.0600** (0.0288) | 0.296** (0.141) | 0.185** (0.0849) |
| Both Plough and Jum Cultivation | -0.0199 (0.0427) | -0.0574 (0.202) | -0.0402 (0.123) |
| Current perception of violence | | | |
| Fear of armed conflict | -0.00457 (0.0356) | -0.00155 (0.188) | -0.00913 (0.113) |
| Fear of communal violence | 0.123*** (0.0364) | 0.634*** (0.180) | 0.362*** (0.108) |
| Fear of eviction from own land | -0.0115 (0.0371) | -0.0547 (0.184) | 0.00799 (0.110) |
| Constant | -0.367*** (0.132) | -4.337*** (0.676) | -2.576*** (0.411) |
| Observations | 1,285 | 1,285 | 1,285 |
| Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1 | | | |

Source: authors' estimation.

Annex Table 19: Robustness of Probit estimation for specification 2

| Independent Variables | Dependent Variable: Mixed crops | | |
|---|---|---|---|
| | LPM | Logit | Probit |
| Household size | 0.00397(0.00698) | 0.0187(0.0333) | 0.0106(0.0201) |
| Per capita asset | -7.61e-07**(3.58e-07) | -6.27e-06(3.88e-06) | -3.19e-06(2.27e-06) |
| Age of household head | 0.000550(0.00100) | 0.00279(0.00491) | 0.00125(0.00295) |
| Sex of household head; male | -0.0284(0.0279) | -0.165(0.138) | -0.0876(0.0831) |
| Educational status of household head; no education as reference category | | | |
| Primary completed | -0.140(0.106) | -0.698(0.494) | -0.384(0.319) |
| Secondary completed | -0.119(0.107) | -0.587(0.499) | -0.326(0.323) |
| Above secondary | -0.0614(0.108) | -0.297(0.504) | -0.155(0.325) |
| Log amount of cultivated land | 0.189***(0.0120) | 0.935***(0.0784) | 0.553***(0.0433) |
| Social capital; Good relation among indigenous community | 0.00140(0.0421) | 0.0290(0.206) | 0.0119(0.128) |
| Type of cultivation: plough cultivation as reference category | | | |
| Jum Cultivation | 0.0653**(0.0289) | 0.321**(0.139) | 0.197**(0.0844) |
| Both Plough and Jum Cultivation | -0.0492(0.0423) | -0.210(0.199) | -0.138(0.120) |
| Previous experience of violence | | | |
| Displacement | -0.00755(0.0376) | -0.0686(0.183) | -0.0396(0.109) |
| Land dispossession | -0.0409(0.0309) | -0.221(0.147) | -0.134(0.0901) |
| Armed conflict | 0.0563*(0.0331) | 0.320*(0.171) | 0.203**(0.101) |
| Constant | -0.324**(0.140) | -4.041***(0.703) | -2.405***(0.430) |
| Observations | 1,285 | 1,285 | 1,285 |
| Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1 | | | |

Source: authors' estimation.

Annex Table 20: Durbin-Wu-Hausman test of exogeneity for specification-1 of ivprobit estimation

```
. probit  croptype3  hhsize pc_asset age_hhhead sex_hhhead  edu_hhhead1 edu_hhhe
> ad2 edu_hhhead3 lncult_land   type_cultivation2 type_cultivation3  p_armedconf
> lict p_evictedland p_communalthreat  resid, robust

Iteration 0:    log pseudolikelihood = -884.60474
Iteration 1:    log pseudolikelihood = -751.94516
Iteration 2:    log pseudolikelihood = -751.46539
Iteration 3:    log pseudolikelihood = -751.46525
Iteration 4:    log pseudolikelihood = -751.46525

Probit regression                           Number of obs   =        1285
                                            Wald chi2(14)   =      212.67
                                            Prob > chi2     =      0.0000
Log pseudolikelihood = -751.46525           Pseudo R2       =      0.1505
```

| croptype3 | Coef. | Robust Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| hhsize | .0267393 | .0285518 | 0.94 | 0.349 | -.0292211 | .0826998 |
| pc_asset | -1.41e-06 | 1.67e-06 | -0.85 | 0.398 | -4.69e-06 | 1.86e-06 |
| age_hhhead | .002225 | .0030578 | 0.73 | 0.467 | -.0037681 | .0082182 |
| sex_hhhead | -.0535256 | .0867454 | -0.62 | 0.537 | -.2235434 | .1164921 |
| edu_hhhead1 | -.2993043 | .3199099 | -0.94 | 0.349 | -.9263162 | .3277077 |
| edu_hhhead2 | -.23852 | .3241604 | -0.74 | 0.462 | -.8738626 | .3968227 |
| edu_hhhead3 | -.0802243 | .3249885 | -0.25 | 0.805 | -.7171902 | .5567415 |
| lncult_land | .5210406 | .0563678 | 9.24 | 0.000 | .4105617 | .6315194 |
| type_culti~2 | .121902 | .1238976 | 0.98 | 0.325 | -.1209327 | .3647368 |
| type_culti~3 | .131076 | .2684483 | 0.49 | 0.625 | -.3950729 | .657225 |
| p_armedcon~t | -.0122318 | .1134516 | -0.11 | 0.914 | -.2345928 | .2101292 |
| p_evictedl~d | .0071771 | .1099512 | 0.07 | 0.948 | -.2083234 | .2226775 |
| p_communal~t | .3594796 | .1078107 | 3.33 | 0.001 | .1481745 | .5707846 |
| resid | .6265862 | .8881 | 0.71 | 0.480 | -1.114058 | 2.36723 |
| _cons | -2.797905 | .514445 | -5.44 | 0.000 | -3.806199 | -1.789612 |

Source: authors' estimation.

Annex Table 21: Alternative Hausman test of exogeneity for specification-1 of ivprobit estimation

```
. hausman probit ivprobit

Note:  the rank of the differenced variance matrix (12) does not equal the number
       of coefficients being tested (13); be sure this is what you expect, or
       there may be problems computing the test.  Examine the output of your
       estimators for anything unexpected and possibly consider scaling your
       variables so that the coefficients are on a similar scale.
```

| | —— Coefficients —— | | | |
|---|---|---|---|---|
| | (b) | (B) | (b-B) | sqrt(diag(V_b-V_B)) |
| | probit | ivprobit | Difference | S.E. |
| hhsize | .0123259 | .0170881 | -.0047621 | . |
| pc_asset | -2.52e-06 | -2.21e-06 | -3.05e-07 | . |
| age_hhhead | .0016594 | .0017043 | -.0000449 | .0003563 |
| sex_hhhead | -.0733154 | -.0601926 | -.0131228 | . |
| edu_hhhead1 | -.3391165 | -.2975721 | -.0415444 | . |
| edu_hhhead2 | -.2795138 | -.2317209 | -.0477929 | . |
| edu_hhhead3 | -.1103845 | -.0789546 | -.0314299 | . |
| lncult_land | .547792 | .5393627 | .0084293 | . |
| type_culti~2 | .1853635 | .1488875 | .036476 | . |
| type_culti~3 | -.04016 | .0125045 | -.0526645 | . |
| p_armedcon~t | -.009132 | -.1423964 | .1332644 | . |
| p_evictedl~d | .0079896 | -.2451706 | .2531602 | . |
| p_communal~t | .3621764 | .8712101 | -.5090336 | . |

```
                 b = consistent under Ho and Ha; obtained from probit
       B = inconsistent under Ha, efficient under Ho; obtained from ivprobit

   Test:  Ho:  difference in coefficients not systematic

              chi2(12) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                       =          3.51
            Prob>chi2 =        0.9908
            (V_b-V_B is not positive definite)
.
```
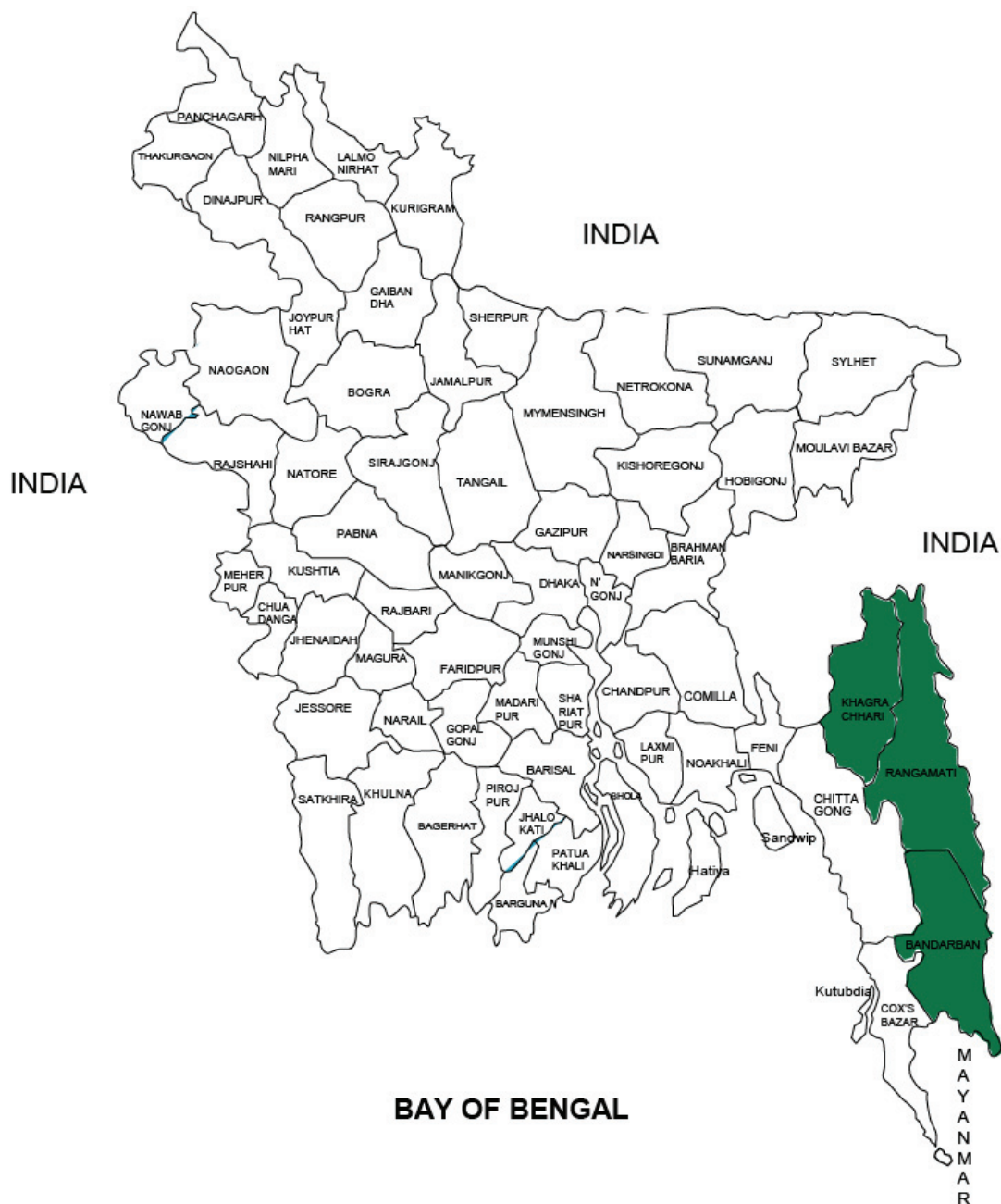
Source: authors' estimation.

**Appendix 2: Chittagong Hill Tracts in Map of Bangladesh (shaded area)**



Source: authors' illustration.