Climate Change Perception and the Importance of Agriculture in Household Income: Evidence from India

CLIMATE CHANGE REALIZATION AND THE IMPORTANCE OF AGRICULTURE IN HOUSEHOLD INCOME: EVIDENCE FROM INDIA

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1. Abstract

As climate change begins to change seasonal patterns around the world and policies are created to help and incentivize people to adapt, it is important to understand whether those that are that are affected are realizing the changes, and would take advantage of resources provided. Using data on a representative sample of 3,000 rural households from drought-prone region of Bihar, India, we investigate this assumption. Seven indicators of how households perceive climate change (whether they noted an increase in rain, more frequent droughts, more frequent floods, a delay in the start of the rainy/monsoon seasons, an increase in the number of hot days in the last five years, how the previous year's monsoon season start date compared to previous years' start dates, and in what month the previous year's monsoon season began) were compared to historical weather information to determine whether they were correct. Whether or not they perceived the climate indicators correctly was then compared to whether their income sources were made up primarily of agriculture. A significant positive relationship between agriculture making up a top position in income and perception of trends in flood occurrences and number of hot days in the last five years, while a negative significant relationship was found for the perception of trends in the occurrences of drought and monsoon start dates in the previous five years. All other relationships were not significant. The evidence is not consistent across all indicators of perception of climate change and weather events.

2. Introduction

Climate change is a worldwide problem, threatening health, food security, and long-term economies worldwide (Patz et al, 2014; Wheeler and von Braun, 2013; Tol, 2018). Recommendations for policymakers has moved beyond mitigation and a strong emphasis has been placed on adaptation in order to cope with the consequences of a changing worldwide climate (IPCC, 2014). However, climate change adaptation policy can be difficult to put in place, and specific factors must exist to drive planning and implementation, including societal values and risk perception (IPCC, 2014).

Some policies seek to provide climate services to households to help households understand and prepare for weather changes and providing advising (Tall et al, 2011). However, in order for any climate services to be effective, households must be able to perceive and understand climate changes to see the worth of those services and actually put them into place. And while climate change is a subject discussed often in scientific communities, it is unclear whether those in communities that will be impacted most by it. In order to best focus efforts and services to those that need the information most, it is necessary to understand whether the perception and buy-in to the need of those services exists, and what factors may impact peoples' understanding and perception of the changing climate.

In this study, we explore factors that affect people's perception of climate change, as adaptation in any form cannot occur if people do not recognize that climate change is occurring and the risk that it presents to their livelihoods. More specifically, we investigate whether people whose livelihoods are strongly dependent on agriculture are more accurately perceptive about climate change.

3. Related Studies

How people perceive the world and the accuracy of those perceptions can be affected by their environments. Perceptions on issues as diverse as the state of their local economy to the climate are affected by different factors, with the most common factor being how much stake the individual has in perceiving the issue in question being a certain way. For instance, Niemi, Bremer, and Heel (1999) found that there is a relationship between people perceiving the economy positively with whether their political beliefs aligns with the party in power at the time. In another study looking at awareness of an agricultural technology, the profitability of using that technology in the specific type of farm had an impact on the awareness level of farmers (Daberkow and McBride, 2003). In general, people see the world and form their views based on what will be most impactful on their lives, and their perceptions are not based solely in the objective truth.

When it comes to peoples' perceptions of climate and weather, this idea is assumed: people who are most dependent on agriculture for their livelihoods are more likely to be paying attention to weather patterns and have a better grasp on what is happening with the climate. Many studies have studied what factors cause farmers in developing nations to perceive climate change and whether those perceptions cause farmers to make adaptations to their farming methods (Nhemachena and Hassan, 2007; Debela et al 2015; Abidoye, Kurukulasuriya, and Mendelsohn, 2017). The studies find that, in general, farmers are perceiving changes in climate, with the major factors affecting their perception being education level, age, and access to extension information. However, these studies do not consider the reliance of household income as a potential contributing factor. Unlike previous studies, we examine the accuracy of perception of climate change and whether households with greater dependence on agriculture for

their livelihoods have more accurate perception of climate change. Abidoye, Kurukulasuriya, and Mendelsohn (2017) do attribute the high rates of perception in their sample to the farmers' dependence on farming income, stating "Because they so heavily depend on the weather to survive, they are fully aware of changes," without empirical evidence to support this relationship. But they do not examine the accuracy of the climate change perception.

There are studies that consider income source as a factor in whether people perceive climate change and make changes. Asrat and Simane (2018) used the Heckman two-step regression model to determine the factors that affect perception and, dependent upon the perception from the first model, adaption to climate change. They found that off-farm income does significantly affect the decision to adapt to climate change, but in conflicting directions: negatively in the dry lowland and positively in the wet lowland. However, this study did not determine what affects how correctly people perceive climate change, but instead if they perceive any changes in the climate at all. Oluwatusin (2014) did bridge the gap and study what affected farmers' correct perceptions regarding climate change in Nigeria. Oluwatusin also used the Heckman's two-step regression with adaptation but used the first step to evaluate not only that people were perceiving climate change, but also that their perception matched actual weather data. They found that education and access to extension information were important, as well as gender (female farmers are more likely to perceive climate change correctly) and farm size. Oluwatusin included a variable for off-farm income as well, but only as a dummy variable regarding the presence of any off-farm income that the family received.

Finally, there are a plenty of studies from the psychological standpoint regarding how climate change is perceived. According to Howe et al. (2015), much of climate change perception can be determined by demographic and geographic characteristics, while Weber

(2010) attributed the difference in opinion to political ideology. Waldman et al. (2019) summarized some of the differences in perception of climate in farmers in Zambia as cognitive bias. Despite many farmers being able to recall weather patterns in the last decade, they still perceived that the rainy season was coming later when there was simply interannual variation. The study found that gender and education, along with food inadequacy, could account for some of the cognitive bias.

In this paper, we build upon the previous studies. We specifically test the hypothesis that being more dependent upon agriculture for household income, captured by whether agriculture falls into the top one or two spots in a farmer's ordered income sources, has a significant positive impact on farmers correctly perceiving climate change. To best of our knowledge, this constitutes a new contribution to the literature on perception of climate change.

4. Study Area, Data, and Empirical Analysis

4.1 Study Area

Our study area is two districts in the Indian state of Bihar. Bihar has two distinct agro-climatic zones: drought prone and flood prone. The districts of Nawada and Jehanabad fall in the drought prone area. The two districts are 2924 and 627 square kilometers, respectively, and have similar annual weather trends. In Nawada, the average annual rainfall is 1037 mm, while it is 1052 mm in Jehanabad (Ministry of Water Resource, Government of India, 2013). Average temperature ranges as a high of 33 to 46 degrees Celsius and a low of 4 to 16 degrees Celsius in both districts, and they both fall into Agro-Climatic Zone IIIB, which of the four zones into which India is split, is the one that receives the least rainfall (Government of Bihar).

The population of both districts is are largely rural and agrarian. The population of Nawada and Jehanabad are 2,219,146 and 1,125,313 respectively, accounting for 2.13% and 1.08% of Bihar's population. 90% of Nawada's population lives in rural areas, while 88% of Jehanabad's does. Approximately 90% of both districts' working populations work in rural areas. Marginal workers, or those that work less than 6 months out of the year, are mainly agricultural laborers in both districts, making up 23% of the workforce in Nawada and 19% in Jehanabad, while marginal workers that are cultivators only make up 10% of both populations. For main workers, or those that work ten months or more per year, the proportion of agricultural laborers is higher in both districts. 21% works as cultivators in both districts, while agricultural main laborers make up 26% of the labor force in Nawada, and 30% in Jehanabad. Overall, the majority of the working population in both districts is in agriculture: 75% in Nawada and 73% in Jehanabad.

4.2. Data Sources and Sampling

We use a representative survey data on 3,300 households from Nawada and Jehanabad.[1] A multi-stage stratified systemic sampling technique was used to for data collection. A randomly selected 20 households per village, 11 villages per block, and 6 blocks per district, were surveyed, resulting in the sample of 3,300 households.

Of the 3,300 households, 90% were male-headed, with an average age of household at 46 years. Average household size is 6, and 26% of the household heads have at least high school education. Over one third of the households own farmland, and 29% have irrigation access. Animal ownership, an indication of asset ownership and wealth, is quite low, with 31% owning

[1] Data collection was led by Tauhidur Rahman as a part of a collaborative project between the JEEVIKA, rural livelihoods program of the Government of Bihar, and International Research Application Program (a joint project between the University of Arizona and Columbia University, funded by the National Oceanic and Atmospheric Administration).

cows and 23% holding either a buffalo or goat. Of the one-third that own land, the average size of the land holding is 11.22 kathas (equivalent to 0.14 hectares).

Households reported their level of trust in public institutions. 38% of the households have strong confidence in the government. Some are members of local groups: one-tenth are members of a farmers' union, and one-fifth are members of a local credit group. Sources of climate information and the percentages of households that identified the source as their main supplier of climate information include Cooperatives and Producer's Associations (2%), television and radio (21%), agricultural extension (31%), and neighbors or relatives (33%). 69% of households did receive information regarding climate from at least one source.

Households were asked to gauge their perception regarding weather trends. 68% of households perceived that there had been an increase in rain in the last 5 years, and 50% perceived that they had seen a delay in the beginning of the monsoon season, and 50% perceived that the monsoon season ended earlier in the last five years. 33% and 25% perceived that there was more frequent flood and drought in the last 5 years, respectively, and 46% perceived an increase in the number of hot days in the year over the last 5 years.

4.2.1. Outcome variables: Accuracy of Perceived Climate Change

In order to ascertain whether households correctly perceived climatic patterns, we compare their perceptions with the actual data from the Indian Meteorological Department (IMD). More specifically, we use data on trends of rainfall averages, flood and drought occurrences, and monsoon start and delay dates, among others, IMD. While analysis of trends compared to historical averages was not available, best judgement was employed to determine the best true climate indicators to match the survey questions.

For annual rainfall, overall rainfall amounts were examined over the years of 2011 and 2016. The rainfall totals rise and fall year to year, but between 2011 and 2016, Newada had an increase of 76%, and Jehanabad 24%. Jehanabad and Newada both were considered to have an increase in rainfall during this period.

We determine flood and drought trends by the number of months that rainfall was significantly above or below average. In each annual rainfall report, IMD determined weather each month was considered to be large excess, excess, normal, deficient, or large deficient. Comparing months of large excess and excess over the period of 2011-2016, the numbers were consistent, which gave no indication of increased flooding. In a similar comparison of deficient or large deficient months, the months categorized this way indicated no increase in drought either. While June 1st (Indian Meteorological Department) is considered the normal date for monsoon season to

Monsoon season was also evaluated over the years of 2011-2016. make landfall in the southwestern coastline, every year except 2012 had a later date of monsoon start, with it being as late as June 5th in 2015.

The monsoon date for the previous year of 2015 was June 5, later than the average June 1st date. Therefore, the indicator for whether last year's monsoon start date was later than previous years was that it was, and the final indicator of the month of the monsoon start date for the previous year was June.

Because the Indian Meteorological Department did not record the number of hot days, the trend of an increase in hot days was extrapolated from a paper regarding how climate change was affecting the country of India, with higher temperatures year-round (Rathore, Attri, and Jaswell, 2013).

We then used these approximations of actual climatic pattern to determine a household's perception of climatic change were accurate. The outcome variables represent whether a household has perceived climatic change correctly, and these outcome variables are determined both for perceptions about five-year trend and the perception about climatic condition in the preceding year.

Table 1 reports the descriptive statistics of explanatory variables. The first block, the dependent variables, come from the survey questionnaire "*Has your household noticed the following change in the last five years?"* for an increase in rain, more frequent droughts, more frequent floods, a delay in the start of the rainy/monsoon seasons, the rainy/monsoon season ending sooner, and an increase in the number of hot days. The dependent variables also come from the questions regarding the last year, which came from the questions *"In your view did the monsoon begin early, on time, or late this year, in 2016?" and "In which month did the monsoon/rainy season begin this year, in 2016?"* The answers to these questions were compared to the reality for each variable, as defined in the previous section, to create a dummy variable for each, in which 1 represented a correct perception, and 0 represented an incorrect perception.

4.2.2. Other Explanatory Variables

The main explanatory variables, shown in Table 2, are the variables that describe to what extent the household depends on agriculture for their livelihood. The control variables were based on the review of existing literature on climate change perception and adaptation and availability in the dataset. All explanatory variables can be grouped into a) Agriculture as an income source, b) Access to information, c) Household characteristics, D) Asset ownership, and e) Social capital.

Agriculture Percentage of Income

Ideally, a variable would exist that would have the household estimate the percentage of their income that is made up of agriculture. However, this was not a question that was asked in the questionnaire. Additionally, because much of the area is dependent upon subsistence agriculture, the question is likely to be difficult to quantify, as the household is consuming the product rather than selling it.

As a proxy for the agricultural portion of the households' incomes, a variable was created from the questions *"What were [Head of household]'s 2 main income generating activities?"* for each of the three main seasons. If during any of the three seasons one of the top two income generating activities was agriculture, the variable indicating the top income generating activities were agriculture was 1. If during any of the three seasons, both income generating sources were agriculture, the variable indicating the top two activities were agriculture was 1. Otherwise, both variables were a 0 for agriculture not being in the top two or both of the top two agriculture sources.

We hypothesized that households who are more heavily dependent upon agriculture would be more in tune with the changes, or lack thereof, in weather patterns. If the hypothesis is true, there will be a significant positive relationship between having agriculture as a main source of income and the correct perception of the weather condition, and the coefficient would be larger for agriculture being in both slots for top two sources of income than if it were just one top source.

Access to Information

The survey respondents were asked if they received information regarding weather conditions from the following sources: a) Agricultural extension services, b) Non-governmental organizations, c) Cooperative, d) Producer's Association, e) Neighbor or relative, f) Television or radio, g) Mobile phone service, h) Paper media, i) Self-help group or *Jeevika*, and j) Other sources. Climate information would be a direct source to influence their perceptions, and the hypothesis is that access to information would have a positive relationship with climate condition perceptions being correct.

Household characteristics

Household characteristics considered as control variables include head of household gender, head of household age, head of household education level, and family size. Studies regarding perception point to age influencing weather perceptions, as age can translate to years of farming experience and therefore knowledge of conditions (Patt and Schröter 2008; Deressa et al. 2011; Juana et al. 2013). Female head of households have been shown to be less likely to correctly perceive changes in climate due to their lack of access to information and services in developing nations (Floro, Yesuf, and Woldensenbet, 2019). Education levels of head of households have been shown to allow farmers to more correctly perceive climate change and comprehend the impacts (Maddison 2007; Mustapha et al. 2012). Size of household was shown to negatively related to climate change perception (Ndambiri et al., 2012). The hypothesized relationships with correctly perceiving climate change are positive for age of head of household, negative for female head of household, positive for education level of head of household, and negative for size of household.

Asset Ownership

Asset ownership is represented by livestock and land ownership in this sample. Because ownership of livestock is an investment in rural households (Bosman, Moll, and Udo, 1997), it can be used as a proxy for how wealthy a family is. Livestock ownership can potentially be a source of risk diversification (Ligon and Schechter, 2003), allowing households more flexibility when climate does change and allowing them to not be as perceptive to the changes. For these reasons, livestock ownership is hypothesized to have a negative relationship with climate condition perception.

Social Capital

Social capital is represented by memberships to local groups, including local credit groups and farmers' unions. Access to groups which provide information have been shown to improve perception regarding climate change (Maddison, 2007). Social capital is also represented by how the households rated their trust in government, which strengthens their access to information. If they do not trust the information that they receive, it will not change their perception. The expected relationships of these proxies of social capital are all positive.

Table 1. Descriptive statistics of explanatory variables

Variable	Observations	Mean	Std. Dev	Minimum	Maximum
Change in rain over last five years	5529	0.8121	0.3906	0	1
Change in drought occurrences in last five years	6555	0.7490	0.4330	0	1
Change in flood occurrences in last five years	6600	0.6290	0.4830	0	1
Change in date of monsoon start in last five years	6534	0.5892	0.4920	0	1
Change in number of hot days in last five years	6600	0.4578	0.4982	0	1
Change in last year's monsoon start date compared to past	6600	0.2078	0.4058	0	1
Month of last year's monsoon start date	6600	0.1306	0.3369	0	1

Table 2. Descriptive statistics of all control variables

Variable	Observations	Mean	Std. Dev	Minimum	Maximum
Both own and lease farm land	6600	0.0693	0.2544	0	1
Male head of household	6600	0.8984	0.3020	0	1
Age of head of household	6378	45.5833	14.6295	1	90
Head of household literacy	4657	0.5827	0.4931	0	1
Own cow	6600	0.3133	0.4638	0	1
Own buffalo	6600	0.2327	0.4226	0	1
Own goat	6600	0.2251	0.4177	0	1
Household considers climate in agricultural decisions	6538	0.5558	0.4969	0	1
Household belongs to a union	6600	0.2560	0.4364	0	1
Household confidence in government	6426	1.9019	0.8177	1	3
Household owns television	6600	0.1415	0.3485	0	1
Household owns radio	6600	0.0827	0.2754	0	1
Household receives climate information from any source	6600	0.6021	0.4895	0	1
Household receives climate information from an organization	6600	0.3406	0.4739	0	1

4.3. Empirical Model

The main question of interest in this paper is whether the accuracy of households' perception of climatic change is strongly correlated with the reliance of their income on on agriculture. To test this hypothesis, we estimate the following regression equation.

$$Y_{ivb} = \alpha + \mathrm{B}' * Z + \partial * x + \mathcal{E}_{ivb}$$

$$i = 1, \ldots, 25;\ v = 1, \ldots, 132;\ b = 1, \ldots, 12$$

The Yivb represent the outcomes for ith household correctly or incorrectly perceiving the climate conditions, taking either a value of 1 or 0. Xivb represents a matrix of explanatory variables, Z is a dummy variable taking the value of 1 if the household indicated that their income is their top or top two source(s) of income, α is the district fixed effects, and Ɛivb is the error term clustered at the village level.

5. Results

To begin the empirical analysis, we first examine the number of households who have incomes made up by agriculture. Table 2 identifies the percent of households that have their primary income as agriculture, as well as incomes made up in both the primary and secondary position by agriculture.

Table 2 Percent of households with income made up of agriculture

Variable	Newada	Jehanabad	Entire Sample
Primary or secondary household income is agriculture	71.47	83.51	77.84
Primary and secondary household income is agriculture	47.70	75.08	60.88

Overall, almost 78% of the respondents have agriculture as a top or second source of income, while almost 61% have both top sources of income made up of agriculture. Jehanabad has a

much higher percentage of primarily agricultural workers, at 84% and 75%, compared to Newada's 71% and 48%.

Next are the results of the regressions, shown in tables 2.4-2.17 The effect of agricultural income on a person's perception of climate changes depends on the variable. Changes in rainfall over the last five years, shown in tables 2.4 and 2.5, was not significant no matter the level of income that was made up by agriculture.

In the case of changes in drought and flood trends over the last five years, shown in tables 2.6-2.9, agriculture being a significant portion of income had a significant effect. In the case of drought, it had a significantly negative effect on a correct perception for both agriculture being in the top two or being the top two. In the case of flood, it had a positive effect.

The number of hot days did have a significant relationship that matched the hypothesized relationship, shown in tables 2.10-2.11. Households that had either their income made up of agriculture either as the top source or the second highest source were more likely to correctly perceive the increase in the number of hot days occurring in India. This relationship remained significant even when a mix of control variables were added to the regression.

In the case of monsoon trends over the past five years, agricultural income being a top income source had a significant effect, as shown in tables 2.12-2.13. The results again indicated a negative relationship of agriculture income to climate perception and was significant both

when agriculture made up one of the top income spots and when it made up both top income spots.

The final two variables, shown in tables 2.14-2.17, were regarding the monsoon season start from the previous year, both if the monsoon season start was delayed, and the particular month that it began. For the month of monsoon start, the relationship was positive in most cases and significant at the .10 level, but with certain control variables included, the significance disappeared. For the month of monsoon start in the last year, agricultural income was not significant no matter the position it held in the order of sources.

6. Conclusions

The results of this study did not necessarily match the hypothesized relationship between agricultural income and correctness of climate change perception. In some cases, it had a positive impact, while in others it had a negative or no significant impact at all. There were consistent variables that did have an impact, such as gender, access to climate information, and ownership of land. Similar to other studies mentioned in the literature review, the perception of climate change may be more related to demographic factors rather than dependency on the weather for income.

These results are important as governments make decisions around distributing climate information and adaptation strategies to populations. While it may be assumed that farmers are the ones that are paying attention and understand climate change from their experience, there may be other and more telling factors that would allow them to more accurately target groups that need information and resources to cope with change.

7. Appendix

Table 3.1 Regression results for households correctly perceiving five-year rainfall change with explanatory variable of either primary and secondary household income being agriculture, testing whether having income make up one of the top income slots makes households more likely to perceive rainfall changes correctly.

Primary or secondary household income is agriculture	0.0282 (0.0171)	0.0086 (0.0159)	-0.0120 (0.0164	0.0078 (0.0159)	0.0069 (0.0160)	-0.0154 (0.0169)	0.0119 (0.0155)
Household Size	-0.0008 (0.0036)	0.0002 (0.0028)	-0.001 (0.0026)	0.0002 (0.0029)	0.0001 (0.0029)	-0.002 (0.0028)	-0.0005 (0.0029)
Male Head of Household	-0.1519*** (0.0423)	-0.0569 (0.0438)	-0.0578 (0.0430)	-0.0573 (0.0441)	-0.0561 (0.0440)	-0.0576 (0.0444)	-0.0552 (0.0423)
Head of Household Age	-0.0002 (0.0005)	-0.0002 (0.0005)		-0.0001 (0.0005)		-0.0003 (0.0005)	-0.0002 (0.0005)
District Dummy Variable	-0.4561*** (0.0290)	-0.4917*** (0.0391)	-0.4888*** (0.0387)	-0.4912*** (0.0389)	-0.4905*** (0.0389)	-0.4543*** (0.0398)	-0.4739 (0.0369)
Own farmland			0.0479** (0.0187)				
Literate head of household		0.0015 (0.0043)	-0.0034 (0.0049)	0.0013 (0.0044)	0.0004 (0.0040)	0.0047 (0.0048)	0.0023 (0.0048)
Own cow		-0.0068 (0.0186)					-0.0076 (0.0183)
Own buffalo			0.0215 (0.0229)				
Own goat							
Household considers climate in agricultural decisions							
Household belongs to a union							
Household confidence in government							-0.0373** (0.0157)
Household owns television				-0.0040 (0.0221)			
Household owns radio					0.0196 (0.0191)	0.0078 (0.0198)	
Household receives climate information from any source		-0.0116 (0.0315)	-0.0169 (0.0310)	-0.0118 (0.0312)	-0.0132 (0.0312)		-0.0235 (0.0324)
Household receives climate information from an organization						0.0769*** (0.0216)	

Table 3.2 Regression results for households correctly perceiving five-year rainfall change with explanatory variable of either primary and secondary household income being agriculture, testing whether having income make up both of the top income slots makes households more likely to perceive rainfall changes correctly. Compared to table 3.1, this is a higher threshold for the dummy variable of agriculture income, serving as a proxy of the household's reliance on agriculture for income.

Primary and secondary household income is agriculture	-0.0160 (0.0169)		-0.0338** (0.0146)	-0.0139 (0.0139)	-0.0134 (0.0139)	-0.0150 (0.014)	-0.0129 (0.0144)
Household Size	-0.0006 (0.0036)	0.0003 (0.0028)	-0.0013 (0.0027)	0.0003 (0.0029)	0.0002 (0.0029)	-0.0023 (0.0029	-0.0005 (0.0029)
Male Head of Household	-0.1495*** (0.0422)	-0.0521 (0.0429)	-0.0536 (0.0421)	-0.0524 (0.0432)	-0.0511 (0.0431)	-0.0571 (0.0436)	-0.0500 (0.0415
Head of Household Age	-0.0002 (0.0006			-0.0002 (0.0006)	-0.0002 (0.0005)	-0.0003 (0.0005)	-0.0002 (0.0005)
District Dummy Variable	-0.4458 (0.0288)	-0.4873*** (0.0388	-0.4833*** (0.0382)	-0.4871*** (0.0386)	-0.4866*** (0.0386)	-0.4545*** (0.0393)	-0.4690*** (0.0367)
Own farm land			0.0542*** (0.0190)				
Literate head of household		0.0033 (0.0045)	-0.0009 (0.0048)		0.0024 (0.0042)	0.0060 (0.0051)	0.0042 (0.0051)
Own cow		-0.0045 (0.0188)					-0.0051 (0.0185)
Own buffalo			0.0238 (0.0228)				
Household considers climate in agricultural decisions				-0.0109 (0.0301)			
Household confidence in government							-0.0373* (0.0157)
Household owns television				-0.0038 (0.0223)			
Household owns radio					0.0195 (0.0191)	0.0055 (0.0120)	
Household receives climate information from any source		-0.0108 (0.0304)	-0.0198 (0.0299)	-0.0109 (0.0301)	-0.0124 (0.0300		-0.0222 (0.0313)
Household receives climate information from an organization						0.0731***	

						(0.0194)	

Table 3.3 Regression results for households correctly perceiving five-year drought change with explanatory variable of either primary and secondary household income being agriculture, testing whether having income make up one of the top income slots makes households more likely to perceive drought changes correctly.

Primary or secondary household income is agriculture	-0.1275*** (0.0269)	-0.1679*** (0.0289)	-0.1928*** (0.0336)	-0.1651*** (0.0288)	-0.1615*** (0.0290	-0.1730*** 0.0329	-0.1644*** (0.02851)
Household Size	-0.0064 (0.0038	-0.0097** (0.0047	-0.0096*** (0.0043)	-0.0091 (0.0047)	-0.0090 (0.0048)	-0.0104** (0.0047)	-0.0093* (0.0047)
Male Head of Household	-0.0173 (0.0303)	0.0089 (0.0407)	0.0008 (0.0390)	0.0075 (0.0411)	0.0048 (0.0414)	0.0021 (0.0418)	0.0112 (0.0408)
Head of Household Age	0.0001 (0.0007)	0.0008 (0.0009)		0.0009 (0.0009)	0.0009 (0.0009)	0.0009 (0.0009)	0.0010 (0.0010)
District Dummy Variable	0.1366*** (0.0375)	0.1466*** (0.0424)	0.1527** (0.0414)	0.1445*** (0.0418)	0.1413*** (0.0414)	0.1585*** (0.0482)	0.1494*** (0.0448)
Own farm land			0.0889*** (0.0329)				
Literate head of household		0.0415 (0.0320)	0.0248 (0.02897)	0.0477 (0.0312)	0.0469 (0.0316)	0.0505 (0.0316)	0.0414 (0.0327)
Own cow		0.0124 (0.0250)					0.0142 (0.0248)
Own buffalo			0.0007 (0.0278				
Household confidence in government							-0.0091 (0.0237)
Household owns television				-0.0445 (0.0342)			
Household owns radio					-0.1286*** (0.0464)	-0.1383*** (0.0461)	
Household receives climate information from any source		-0.0496 (0.0401)	-0.0558 (0.0407)	-0.0461 (0.0401)	-0.0425 (0.0397)		-0.0543 (0.0394)
Household receives climate information from an organization						0.0262 (0.0453)	

Table 3.4 Regression results for households correctly perceiving five-year drought change with explanatory variable of either primary and secondary household income being agriculture, testing whether having income make up both of the top income slots makes households more likely to perceive drought changes correctly. Compared to table 3.3, this is a higher threshold for the dummy variable of agriculture income, serving as a proxy of the household's reliance on agriculture for income.

Primary and secondary household income is agriculture	-0.0616** (0.0268)	-0.0933*** (0.0045)	-0.1069*** (0.0347)	-0.0939*** (0.0319)	-0.0972*** (0.0315)	-0.0913*** (0.0320)	-0.0978*** (0.0314)
Household Size	-0.0076* (0.0039)	-0.012** (0.0048)	-0.0111** (0.0043)	-0.0108** (0.0048)	-0.0107** (0.0049)	-0.0111** (0.0049)	-0.0120** (0.0044)
Male Head of Household	-0.0212 (0.0295)	-0.0062 (0.0397)	-0.0171 (0.0381)	-0.0078 (0.0402)	-0.0089 (0.0407)	-0.0043 (0.0401)	-0.0147 (0.0409)
Head of Household Age	0.0001 (0.0007)	0.0010 (0.00) 10		0.0011 (0.0010)	0.0012 (0.00 10)	0.0011 (0.0010)	0.0010 (0.0010)
District Dummy Variable	0.1371*** (0.04027)	0.1446*** (0.0446)	0.1492*** (0.04357846)	0.1429528** (0.0441)	0.1405*** (0.0435)	0.1487*** (0.0467)	0.1460*** (0.0496)
Own farm land			0.0673** (0.0322)				
Both own and lease farm land							
Literate head of household		-0.0111 (0.0324)	0.0344 (0.0296)	0.0552* (0.0315)	0.0544* (0.0321)	0.0479 (0.0332)	0.0577* (0.0321)
Own cow		0.0064 (0.0258)				0.0089171 (0.02556179)	
Own buffalo			0.0025 (0.0293)				
Household confidence in government						-0.0120 (0.0247)	
Household owns television				-0.054 (0.0364)			
Household owns radio					-0.151*** (0.0470)		-0.1581* (0.0471)
Household receives climate information from any source		-0.0705* (0.0412)	-0.0772* (0.0423)	-0.0664 (0.0412	-0.0618 (0.0407)	-0.075* 1 (0.0407	

Table 3.5 Regression results for households correctly perceiving five-year flood change with explanatory variable of either primary and secondary household income being agriculture, testing whether having income make up one of the top income slots makes households more likely to perceive flood changes correctly.

Primary or secondary household income is agriculture	0.2014*** (0.0396)	0.2802*** (0.0426)	0.3012*** (0.0445)	0.2827*** (0.0421)	0.2827*** (0.0422)	0.2760*** (0.0425)	0.2709** (0.0420)
Household Size	-0.0021 (0.0098)	-0.0011 (0.0039)	0.0010 (0.0038)	-0.0006 (0.004)	-0.001 (0.004)	-0.0003 (0.0040)	-0.0006 (0.0041)
Male Head of Household	0.1592*** (0.0437)	0.1650*** (0.0632)	0.1535* (0.0624)	0.1657*** (0.0630)	0.1658*** (0.0632)	0.1736*** (0.0645)	0.1468** (0.0626)
Head of Household Age	0.0006 (0.0007)	0.0006 (0.0009)		0.0007 (0.0009)	0.0007 (0.0009)	0.0007 (0.0008)	0.0005 (0.0009)
District Dummy Variable	0.01611 (0.0313)	0.0581 (0.0381)	0.0515 (0.0382)	0.0565 (0.0379)	0.0564 (0.0382)	0.0774* (0.0401)	0.0452 (0.0395)
Own farm land			-0.0575* (0.0304)				
Literate head of household		-0.0258 (0.0283)	-0.0200 (0.0270)	-0.0237 (0.0280)	-0.0242 (0.0283)	-0.0259 (0.0283)	-0.0239 (0.0288)
Own cow		0.0231 (0.0248)					0.0242 (0.0249)
Own buffalo			-0.0014 (0.0305)				
Household confidence in government							0.0411* (0.0240)
Household owns television				-0.0050 (0.0359)			
Household owns radio					-0.0041 (0.0356)	-0.007 (0.0361)	
Household receives climate information from any source		0.0936** (0.0382)	0.1024 (0.0380)	0.0952** (0.0388)	0.0951** (0.0386)		0.1108*** (0.0397)
Household receives climate information from an organization						0.0954*** (0.0341)	

Table 3.6 Regression results for households correctly perceiving five-year flood change with explanatory variable of either primary and secondary household income being agriculture, testing whether having income make up both of the top income slots makes households more likely to perceive flood changes correctly. Compared to table 3.5, this is a higher threshold for the dummy variable of agriculture income, serving as a proxy of the household's reliance on agriculture for income.

Primary and secondary household income is agriculture	0.1415*** (0.0323)	0.2080*** (0.0375)	0.2206*** (0.0381)	0.2105*** (0.0370	0.2116*** (0.0374)	0.2050*** (0.0376)	0.2173*** (0.0378)
Household Size	-0.00002 (0.0039)	0.0021 (0.0040)	0.0035 (0.0038)	0.0023 (0.0040)	0.0023 (0.0040)	0.0025 (0.0041)	0.0021 (0.0039)
Male Head of Household	0.1620*** (0.0431)	0.1782*** (0.0619)	0.1707*** (0.0606)	0.1798*** (0.0616)	0.1801*** (0.0613)	0.1597*** (0.0617)	0.1858** (0.0634)
Head of Household Age	0.0005 (0.0007)	0.0002 (0.0009)		0.0003 (0.0009)	0.0003 (0.0009)	0.0002 (0.0009)	0.0003 (0.0009)
District Dummy Variable	0.0020 (0.0320)	0.0506 (0.0390)	0.0466 (0.0390)	0.0490 (0.0387)	0.0497 (0.0387)	0.0358 (0.0405)	0.0862** (0.0403)
Own farm land			-0.0354 (0.0293)				
Literate head of household		-0.0413 (0.0299)	-0.0378 (0.0287)	-0.0411 (0.0294)		-0.0391 (0.0303)	-0.0429 (0.0294)
Own cow		0.0285 (0.0244)				0.0279 (0.0245)	
Own buffalo			-0.009 (0.0305)				
Household confidence in government						0.0245* (0.0248)	
Household owns television				0.0123 (0.0357)			
Household owns radio					0.0391 (0.0345)		0.0295 (0.0345)
Household receives climate information from any source		0.1280*** (0.0391	0.1365*** (0.0392)	0.1291*** (0.0396)	0.1278*** (0.0394)	0.1451*** (0.0404)	
Household receives climate information from an organization							0.1565*** (0.0339)

Table 3.7 Regression results for households correctly perceiving five-year change in the number of hot days with explanatory variable of either primary and secondary household income being agriculture, testing whether having income make up one of the top income slots makes households more likely to perceive number of hot days hot days changes correctly.

Primary or secondary household income is agriculture	0.1702*** (0.0337)	0.17963*** (0.0378)	0.1726*** (0.0395)	0.1819*** (0.0378)	0.1843*** (0.0378)	0.1740*** (0.0388)	0.1770*** (0.0387)
Household Size	-0.004 (0.0037)	-0.0017 (0.0039)	0.0012 (0.0036)	-0.0017 (0.0039)	-0.0010 (0.0039)	-0.0033 (0.0039)	-0.0022 (0.0040)
Male Head of Household	-0.1292*** (0.0444)	-0.1278*** (0.0435)	-0.0175 (0.0434)	-0.1250*** (0.0432)	-0.1266*** (0.0434)	-0.1468*** (0.0460)	-0.1251*** 0.0434
Head of Household Age	-0.0013 (0.0007)	-0.0008 (0.0008)		-0.0008 (0.0008)	-0.0006 (0.0008)	-0.0007 (0.0008)	-0.0010 (0.0008)
District Dummy Variable	0.0379 (0.0312)	0.0227 (0.0304)	0.0259 (0.0297)	0.0206 (0.0305)	0.0187 (0.0300)	0.0302 (0.0342	0.0299 (0.0325
Own farm land			0.0397 (0.0298)				
Literate head of household		0.0260 (0.0238)	0.0308 (0.0229)	0.0237 (0.0236)	0.0300 (0.0235)	0.0410 (0.0236)	0.0244 (0.0244)
Own cow		0.0406* (0.0239)					0.0404 (0.0238)
Own buffalo			-0.0462* (0.0254)				
Household confidence in government							0.0164 (0.0219)
Household owns television				0.0493 (0.0348)			
Household owns radio					-0.0653 (0.0408)	-0.0784** (0.041)	
Household receives climate information from any source		-0.1284*** (0.0385)	-0.1424*** 0.0387	-0.1293*** (0.0388)	-0.1238*** (0.019)		-0.1349*** (0.0390
Household receives climate information from an organization						-0.0140 (0.0462)	

Table 3.8 Regression results for households correctly perceiving five-year number of hot days change with explanatory variable of either primary and secondary household income being agriculture, testing whether having income make up both of the top income slots makes households more likely to perceive number of hot days changes correctly. Compared to table 3.7, this is a higher threshold for the dummy variable of agriculture income, serving as a proxy of the household's reliance on agriculture for income.

Primary and secondary household income is agriculture	0.2020*** (0.0302)	0.1933*** (0.0327)	0.1880*** (0.0338)	0.1966*** (0.0327)	0.1946*** (0.0326)	0.1869*** (0.0336)	0.1948*** (0.0322)
Household Size	-0.0023 (0.0037)	-0.0001 (0.004)	0.0002 (0.004)	-0.0002 (0.0039)	0.0006 (0.0039)	-0.0005 (0.0041)	0.0020 (0.0039)
Male Head of Household	-0.1331*** (0.0454)	-0.1319*** (0.0445)	-0.0183 (0.0445)	-0.1294*** (0.0442)	-0.135*** (0.0445)	-0.1286*** (0.0441)	-0.1504*** (0.0472)
Head of Household Age	-0.0013** (0.0007)	-0.0010 (0.0008)		-0.0010 (0.0008)	-0.0008 (0.0008)	-0.0011 (0.0008)	-0.0010 (0.0008)
District Dummy Variable	0.0019* (0.0297)	-0.0047 (0.0293)	0.0008 (0.0286)	-0.0072 (0.0294)	-0.0075 (0.0292)	0.0046 (0.0316)	0.0135 (0.0330)
Own farm land		0.0373 (0.0237)	0.0390 (0.0288)				
Literate head of household		0.0223 (0.0231)	0.0274 (0.0222)	0.0190 (0.0229)	0.0252 (0.0229)	0.0208 (0.0237)	0.0361 (0.0231)
Own cow						0.0364 (0.0237)	
Own buffalo			-0.0536** (0.0256)				
Household considers climate in agricultural decisions		-0.1128*** (0.0385)					
Household confidence in government						-0.0169 (0.0217)	
Household owns television				0.0570* (0.0339)			
Household owns radio					-0.0355 (0.0377)		-0.0525 (0.0377)
Household receives climate information from any source			-0.1278*** (0.0389)	-0.1148** (0.0387)	-0.1093*** (0.0384)	-0.1110*** (0.0393)	
Household receives climate information from an organization							0.0193 (0.0422)

Table 3.9 Regression results for households correctly perceiving five-year monsoon start date change with explanatory variable of either primary and secondary household income being agriculture, testing whether having income make up one of the top income slots makes households more likely to perceive monsoon start date changes correctly.

Primary or secondary household income is agriculture	-0.1320*** (0.0305)	-0.1387*** (0.0344)	-0.1188*** (0.0351)	-0.139*** (0.0341)	-0.1398*** (0.0343)	-0.1408*** (0.0345)	-0.1378*** (0.0344
Household Size	-0.0095** (0.0038)	-0.0076* (0.0041)	-0.0078* (0.0040)	-0.0073* (0.0042)	-0.0078* (0.0042)	-0.0086** (0.0043)	-0.0070 (0.0043)
Male Head of Household	-0.0042 (0.0412)	-0.0179 (0.0416)	-0.0703* (0.0359)	-0.0192 (0.0420)	-0.0184 (0.0417)	-0.0278 (0.0433)	-0.0313 (0.0448)
Head of Household Age	-0.0007 (0.0007)	-0.0004 (0.0009)		-0.0004 (0.0008)	-0.0005 (0.0008)	-0.0005 (0.0008)	-0.0003 (0.0009)
District Dummy Variable	0.0694 (0.0441)	0.0619 (0.0467)	0.0666 (0.0459)	0.0625 (0.0467)	0.0627 (0.0467)	0.0594 (0.0495)	0.03340 (0.0481)
Own farm land			-0.0560* (0.029)				
Literate head of household		0.0096 (0.0292)	0.0157 (0.0278)	0.0130 (0.0290)	0.0087 (0.0290)	0.0137 (0.0295)	0.0092 (0.0290)
Own cow		-0.0122 (0.0245)					-0.0116 (0.0242)
Own buffalo			-0.0206 (0.0235)				
Household considers climate in agricultural decisions							
Household belongs to a union							
Household confidence in government							0.0493* (0.0258)
Household owns television				-0.0438 (0.0316)			
Household owns radio					0.0043 (0.0383)	0.0009 (0.0377)	
Household receives climate information from any source		-0.0584 (0.0364)	-0.0481 (0.0359)	-0.0560 (0.0364)	-0.0592 (0.0363)		-0.0505 (0.0355)
Household receives climate information from an organization						-0.0279 (0.0411)	

Table 3.10 Regression results for households correctly perceiving five-year monsoon start date change with explanatory variable of either primary and secondary household income being agriculture, testing whether having income make up both of the top income slots makes households more likely to perceive monsoon start date changes correctly. Compared to table 3.9, this is a higher threshold for the dummy variable of agriculture income, serving as a proxy of the household's reliance on agriculture for income.

Primary and secondary household income and agriculture	-0.0588* (0.0291)	-0.0775** (0.0306)	-0.0597* (0.0312)	-0.0791** (0.0305)	-0.0788** (0.0307)	-0.0809** (0.0310)	-0.0795*** (0.0303)
Household Size	-0.0109*** (0.0038)	-0.0087** (0.0041)	-0.0084** (0.0039)	-0.0084** (0.0041)	-0.0089** (0.0041)	-0.0081* (0.0042)	-0.0095** (0.0042)
Male Head of Household	-0.0086 (0.0400)	-0.0209 (0.0408)	-0.0737** (0.0354)	-0.0223 (0.0412)	-0.0217 (0.0408)	-0.0346 (0.0438)	-0.0319 (0.0424)
Head of Household Age	-0.0001 (0.0007)	-0.0004 (0.0009)		-0.0003 (0.0008)	-0.0004 (0.0008)	-0.0003 (0.0009)	-0.0005 (0.0008)
District Dummy Variable	0.0685 (0.0444)	0.0637 (0.0471)	0.0660 (0.0461)	0.0648 (0.0472)	0.0644 (0.0472)	0.0357 (0.0486)	0.0528 (0.0499)
Own farm land			-0.0692** (0.0295)				
Literate head of household		0.0127 (0.0291)	0.0202 (0.0276)	0.0165 (0.0289)	0.0122 (0.0289)	0.0124 (0.0288)	0.0175 (0.0294)
Own cow		-0.0145 (0.0241)				-0.0130 (0.0240)	
Own buffalo			-0.0217 (0.0236)				
Household confidence in government						0.0501* (0.0258)	
Household owns television				-0.0480 (0.0313)			
Household owns radio					-0.0122 (0.0385)		-0.0135 (0.0378)
Household receives climate information from any source		-0.0702* (0.0360)	-0.0567 (0.0355)	-0.0676* (0.0359)	-0.0705* (0.0359)	-0.0617* (0.0350)	
Household receives climate information from an organization							-0.0538 (0.0413)

Table 3.11 Regression results for households correctly perceiving last year's monsoon date with explanatory variable of either primary and secondary household income being agriculture, testing whether having income make up one of the top income slots makes households more likely to perceive monsoon start date changes correctly.

Primary or secondary household income is agriculture	0.0217 (0.0191)	0.0282 (0.0194)	0.0241 (0.0199)	0.0311 (0.0194)	0.0304 (0.0194)	0.0313 (0.0199)	0.0294 (0.0201)
Household Size	0.0037 (0.0029)	0.0023 (0.0029)	0.0040 (0.0028)	0.0025 (0.0030)	0.0028 (0.0030)	0.0026 (0.0030)	0.0009 (0.0029)
Male Head of Household	0.1735*** (0.0405)	-0.1982*** (0.0381)	-0.1280*** (0.0393)	-0.1955*** (0.0382)	-0.1956*** (0.0383)	-0.1988*** (0.0396)	-0.1951*** (0.0353)
Head of Household Age	0.00002 (0.0005)	-0.00003 (0.0006)		0.0001 (0.0006)	0.0001 (0.0006)	0.0001 (0.0006)	-0.0001 (0.0006)
District Dummy Variable	0.2825*** (0.0277)	0.2713*** (0.0273)	0.2791*** (0.0281)	0.2689*** (0.0274)	0.2697*** (0.0275)	0.2657*** (0.0296)	0.2904*** (0.0297)
Own farm land		0.0462** (0.0200	0.0392** (0.0190)				
Literate head of household		-0.0041 (0.0181)	-0.0040 (0.0176)	-0.0044 (0.0182)	-0.0023 (0.0184)	-0.0007 (0.0187)	-0.0075 (0.0181)
Own cow							0.0497** (0.0203)
Own buffalo			0.0592** (0.0183)				
Household confidence in government							-0.0428** (0.0175)
Household owns television				0.03120 (0.0252)			
Household owns radio					0.03106 (0.0266)	0.0307 (0.0263)	
Household receives climate information from any source		-0.0232 (0.0268)	-0.0319 (0.0272)	-0.0231 (0.0269)	-0.0223 (0.0270)		-0.0349 (0.0277)
Household receives climate information from an organization						-0.0177 (0.0227)	

Table 3.12 Regression results for households correctly perceiving last year's monsoon start date with explanatory variable of either primary and secondary household income being agriculture, testing whether having income make up both of the top income slots makes households more likely to perceive monsoon start date correctly. Compared to table 3.11, this is a higher threshold for the dummy variable of agriculture income, serving as a proxy of the household's reliance on agriculture for income.

Primary and secondary household income is agriculture	0.0010 (0.0165)	-0.0019 (0.0171)	-0.0029 (0.0179)	0.0017 (0.0172)	0.0023 (0.0171)	-0.0017 (0.0176)	0.0021 (0.0171)
Household Size	0.0039 (0.0029)	0.0024 (0.0029)	0.0040 (0.0028)	0.0027 (0.0029)	0.0030 (0.0030)	0.0011 (0.0029)	0.0028 (0.0030)
Male Head of Household	0.1721*** (0.0404)	-0.1960*** (0.0381)	-0.1263*** (0.0391)	-0.1933*** (0.0381)	-0.1935*** (0.0382)	-0.1927*** (0.0354)	-0.1964*** (0.0396)
Head of Household Age	0.00003 (0.0006)	-0.00002 (0.0006)		0.0001 (0.00059387)	0.0001148 (0.0006)	-0.0001 (0.0006)	0.0001 (0.0006)
District Dummy Variable	0.2852*** (0.0283)	0.2756*** (0.0280	0.2830*** (0.0288)	0.2726*** (0.0281)	0.2732*** (0.0281)	0.2950*** (0.0304)	0.2711*** (0.0298)
Own farm land			0.0448** (0.0191)				
Literate head of household		-0.0048 (0.0181)	-0.0054 (0.0176)	-0.0051 (0.0182)	-0.0029 (0.0183)	-0.0081 (0.0181)	-0.0014 (0.0187)
Own cow		0.0479** (0.0198)				0.0513** (0.0201)	
Own buffalo			-0.0577*** (0.0184)				
Household confidence in government						-0.0431** (0.0176)	
Household owns television				0.03167 (0.0253)			
Household owns radio					0.0333 (0.0264)		0.0326 (0.0261)
Household receives climate information from any source		-0.0210 (0.0270)	-0.0306 (0.0274)	-0.0206 (0.0270)		-0.0327 (0.0278)	
Household receives climate information from an organization					-0.0199 (0.0271)		-0.0123 (0.0226)

Table 3.13 Regression results for households correctly perceiving last year's monsoon date start month with explanatory variable of either primary and secondary household income being agriculture, testing whether having income make up one of the top income slots makes households more likely to perceive monsoon date start month correctly.

Primary or secondary household income is agriculture	0.0202 (0.0175)	0.0112 (0.016)	0.0031 (0.0166)	0.0136 (0.016)	0.0162 (01636)	0.0031 (0.016)	0.0086 (0.0165)
Household Size	0.0046 (0.0030)	0.0025 (0.0031)	0.0028 (0.0029)	0.0032 (0.0032)	0.0033 (0.0032)	0.0039 (0.0030)	0.0013 (0.0031)
Male Head of Household	0.0601*** (0.0223)	0.0397* (0.0203)	0.0115 (0.0236)	0.0410** (0.0203)	0.0401* (0.0204)	0.0577*** (0.0208)	0.0594*** (0.0218)
Head of Household Age	0.0007 (0.0004)	0.0006 (0.0005)		0.0007 (0.0005)	0.0008* (0.0005)	0.0008* (0.0004)	0.0005 (0.0005)
District Dummy Variable	-0.0047 (0.0250)	0.0119 (0.0235)	0.0119 (0.0240)	0.0101 (0.0238)	0.0076 (0.0241)	0.0490** (0.0224)	0.0425** (0.0213)
Own farm land			0.0381** (0.0186)				
Literate head of household		0.0053 (0.0134)	-0.0037 (0.0134)	0.0086 (0.0136)	0.0095 (0.0138)	0.0012 (0.0140)	0.0019 (0.0137)
Own cow		0.0328 (0.0186)					0.0347 (0.0187)
Own buffalo			0.0019 (0.022)				
Household considers climate in agricultural decisions							-0.0572*** (0.0114)
Household owns television				-0.0157 (0.0224)			
Household owns radio					-0.0911*** (0.0239)	-0.0951*** (0.0256)	
Household receives climate information from any source		0.1261*** (0.0180)	0.1232*** (0.0184)	0.1288*** (0.0187)	0.1315*** (0.0188)		0.1163*** (0.0174)
Household receives climate information from an organization						0.1485*** (0.0263)	

Table 3.14 Regression results for households correctly perceiving last year's monsoon start date month with explanatory variable of either primary and secondary household income being agriculture, testing whether having income make up both of the top income slots makes households more likely to perceive monsoon start date month correctly. Compared to table 3.13, this is a higher threshold for the dummy variable of agriculture income, serving as a proxy of the household's reliance on agriculture for income.

Primary and secondary household income and agriculture	0.0296 (0.0164)	0.0310* (0.0167)	0.0270 (0.0173)	0.0329* (0.01710121)	0.0303590* (0.0173)	0.0280* (0.0165)	0.0325* (0.0173)
Household Size	0.0049 (0.0030)	0.0027 (0.0031)	0.0030 (0.0030)	0.0033 (0.0032)	0.0034 (0.0032)	0.0015 (0.0031)	0.0040 (0.0030)
Male Head of Household	0.0592*** (0.0222)	0.0377* (0.0202)	0.0101 (0.0236)	0.0390* (0.0200)	0.0385* (0.0203)	0.0575*** (0.0217)	0.0549*** (0.0207)
Head of Household Age	0.0006 (0.0004)	0.0006 (0.0005)		0.0007 (0.0005)	0.0008* (0.0004)	0.0004 (0.0005)	0.0008* (0.0004)
District Dummy Variable	-0.0106 (0.0256)	0.0051 (0.0238)	0.0055 (0.0243)	0.0032 (0.0243)	0.0018 (0.0244	0.0362* (0.0215)	0.0412* (0.0227
Own farm land			0.0336* (0.0186)				
Literate head of household		0.0051 (0.0135)	-0.0030 (0.0136)	0.0082 (0.0137)	0.0090 (0.0139)	0.0018 (0.0137)	0.0010 (0.0141)
Own cow		0.0313 (0.0182)				0.0331* (0.0183)	
Own buffalo			-0.0002 (0.0216)				
Household confidence in government						-0.0570*** (0.0114)	
Household owns television				-0.0146 (0.0221)			
Household owns radio					-0.0873*** (0.0237)		-0.0921*** (0.0255)
Household receives climate information from any source		0.121*** (0.0181)	0.12409*** (0.0183)	0.1299*** (0.0188)	0.1327*** (0.0189)	0.1171*** (0.0173)	
Household receives climate information from an organization							0.1496*** (0.0263)

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