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Access to Public Provision and Climate Vulnerability of Urban Poor Households in India: IHDS Data Analysis

Sreeja Patra[1] and Debalina Chakravarty[2]

Abstract

Urban poor residing in precarious informal settlements with limited resource accessibility are often one of the most vulnerable populations to climate variability and change. We argue that the climate vulnerability faced by urban poor households can be best understood in terms of resource accessibility by a particular household.Without the proper infrastructural facilities and protection measures (income, health and assets) climate change will exacerbate the poor people's vulnerability to climate change .Therefore, the current study aims to evaluate the access to public provisions like education, employablity, sanitation, food security, electricity services and probability to get exposed to climate-induced vulnerabilities of the urban poor household in India. In particular, the study is trying to discuss how the public provisions could help to secure social and economic vulnerabilities to climate variability and change in urban poor household in India. The results could be useful in developing smart and climate resilient urban India

Keywords:Urban Poor, Climate Vulnerability, Resource Accessibility, Public Provision

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1. Introduction

India has been ranked as the 7th most climate change-affected country in the world in 2019 as per the Global Climate Risk Index, 2021. Climate Change is disproportionately burdening the economy, and therefore adversely affecting the low carbon growth strategies. 8 per 10 Indians are vulnerable to the extreme weather events (CEEW, 2021)[3]. India losses USD 79.5 billion dollar due to extreme weather events in 2019-2020. Climate change is very likely to impact the vast percentage of population living in urban areas of India as shown in the National Communication Reports of India to the United Nations Framework Convention for Climate Change(IPCC, 2023). Predicted climate change impacts include increase in mean intensity of monsoon and spells of excessive rain (Ashrit *et al.*, 2001)sea level rise and inundation of coastal cities (e.g. Mumbai and Chennai)(Brenkert& Malone, 2005), and extreme temperatures and heat spells in hot and dry cities (e.g. Delhi and Hyderabad) (Curran, 2019). In India urbanization is often accompanied by unplanned urban growth and population concentration in potential hazardous places, such as slums or informal settlements with low living standards and poor basic services(Bera *et al.,* 2021; Nath & Sudharshan, 1994). As a result, the potential number of people affected in a disaster increases (Caruso *et al.,* 2021; Revi, 2008; Singh *et al.,* 2021). Under such circumstances, climate vulnerability assessment becomes a key for urban risk management. Vulnerability is intersectional, impacted by multiple environmental, social and economic stressors and changes. For instance, while facing extreme climatic events such as torrential rain followed by flooding and drought, people, usually working classes with marginalised caste identities will also be affected by diseases, poverty, and ailments due to pollution. These issues will lead to highly complicated political and moral challenges like displacement and land conflicts that extend beyond the coastlines. Without the proper infrastructural facilities and protection measures (income, health and assets) climate change will exacerbate the poor people's vulnerability to climate change (Giri *et al.*, 2021). Although initiatives by the government such as developing smart and climate resilient cities in India are prioritising the issues, it mainly focused on the capacity and infrastructure building through the application of modern and effective technology. Authorities treat climate risks, a distinct form of social and environmental risk, as its causes and impacts are global in nature and gently avoid the responsibility of capacity building for climate shocks. However, recent studies pointing to climate risks

[3]https://www.ceew.in/research/climate-resilience

are identified as highly associated with other vulnerabilities. In fact, for combating the adverse impact of climate change building up the adaptive capacities, economy needs several public provisions, especially for the urban marnigalised populations with lack of durable assets, safe housing, safe water, proper sanitation, and tenure security is likely to suffer the most from extreme climate shocks (Anees *et al.,* 2020; Bera *et al.,* 2021; Huong *et al.,* 2019; Singh *et al.,* 2017; Yenneti *et al.,* 2016). Thinking about climate justice around extreme events due to climate change is of social and policy significance in the economy which is even significant for the urban poor. The climate shocks such as cyclones, droughts and floods affect the livelihoods of the urban poor households with multi-dimensional poverty and informality such as inadequate income, poor housing conditions and lower asset base. Therefore, the current study aims to evaluate the access to public provisions like education, employability, sanitation, food security, electricity services and probability to get exposed to climate-induced vulnerabilities of the urban poor household in India. In particular, the study is trying to discuss how the public provisions could help to secure social and economic conditions to climate variability and change in urban poor households in India. The results could be useful in developing smart and climate resilient urban India.

The paper begins with the issues related to climate vulnerability and climate injustice to the urban poor in India amidst the government flagship sustainable development policies like smart and climate resilient urban India. Section two summarises the related literature regarding climate vulnerabilities faced by urban poor households. This section will also try to explore the factors determining the vulnerabilities to climate change of the urban poor household discussed in the available literature. Data and methodology are described in section three. The results of the study are reported in section four. Summary and concluding remarks are provided in the final section.

2. Climate Vulnerability and Urban Poor: A Literature Review

The response to the climate shocks faced by individuals, households and communities is crucial. Climate vulnerability can be conceptualised as the function of climatic risks faced by a household and the characteristics of the(Anees *et al.,* 2020; Bera *et al.,* 2021; Curran *et al.,* 2019; Pandey *et al.,* 2018; Singh *et al.,* 2017) stated vulnerability as the function of risk's characterisation (nature, function and severity), individual's exposure to the risk as well as individual's capability to cope with the risk (Castro & Sen, 2022; IPCC, 2023; Yenneti *et al.,* 2016). stated exposure to the risk may not always make the household vulnerable that shocks might occur, but may not necessarily lead to households being vulnerable (Arora & Kaur,

2023). Climate vulnerability analysis of urban areas also emphasises the physical and ecological infrastructure (Hallegatte *et al.,* 2020; Pandey *et al.,* 2018). However, the process of unplanned and rapid urbanisation itself leads to the creation of new risks, which threaten to erode development gains(Ahluwalia, 2016). The growing number and intensities of climate change bring additional pressure on cities in terms of economic loss as the cities are the hub of assets and properties of an economy(World Bank, 2021; Arora & Kaur, 2023; IPCC, 2023)

2.1.Climate Vulnerability of Urban Poor

In India, while the number of cities/towns increased by three times, the urban population rose by thirteen times between 1901 and 2011, reflecting external economies of agglomeration in larger urban areas(Mohanty & Wadhawan, 2021). The number of census towns in India counted as 49 percentage of the total urban areas, which falls under the rural jurisdictions (Mohanty & Dwivedi, 2021). 30 percentage of the urban population growth has also been experienced in the census towns in India between 2001 and 2011(Mohanty & Wadhawan, 2021), revealing the fact that considerable urbanisation is taking place outside the statutory boundaries of the municipalities and growing in a slum-like fashion without the provision of civic services such as water supply, sewerage and sanitation, drainage, solid waste management, transport(Castro & Sen, 2022; Joakim *et al.,* 2015; Reckien*et al.,* 2017). Cities are also projected to share 80percentage of the world's total GDP and consume 75percentage of the resources (Anees *et al.,* 2020; Gupta *et al.,* 2019; Pandey *et al.,* 2018). The clustering of firms, workers, entrepreneurs and the institutions resulting from the process of urbanisation provides a unique opportunity to the country to accelerate economic growth and reduce poverty by harnessing the synergy between the spatial and structural transformation(Giri *et al.,* 2021; Singh *et al.,* 2021). The agglomeration of economic activities, fueling knowledge-led growth also offers networking externalities and resource mobilisation. However, the externalities of cities are subject to limits and when cities exceed a threshold, congestion diseconomies rise.In India, while the percentage of the urban population living below the poverty line counted at 26.4percentage, the number of urban poor stood at 10.25 crore. The number of rural poor has declined by 6.54 crore, whereas the number of urban poor has gone down by 2.62 crore between 2009-2010 and 2011-2012 (World Bank, 2021).

The IPCC Sixth Assessment Report asserted that 89percentage of urban habitats are exposed to loss of assets and livelihoods due to at least one type of natural disaster (IPCC, 2021).

Floods, droughts and cyclones are the prime factors for the economic losses in urban areas (World Bank, 2021). The risks related to climate change are much higher for lower and middle-income countries than the developed ones(Anees *et al.,* 2020). India is in the third position among the top ten countries with disaster losses (Bera *et al.,* 2021; Michael& Bansal, 2023; World Bank, 2021). The World Meteorological Organization (WMO) reported the economic losses due to climate-induced shocks account for 600 crores rupees in India (World Bank, 2021).

2.2.Indicators of climate change vulnerability for the urban poor household

The urban poor households are particularly vulnerable to climate change and natural hazards due to the living conditions in which they live within cities. Inadequate infrastructure, lack of basic services, precarious housing conditions and lack of medical facilities can turn natural hazards into disasters (Giri *et al.,* 2021; Gupta *et al.,* 2019; Michael & Bansal, 2023; Pandey *et al.,* 2018). For instance, poor solid waste management can cause blockage to stormwater and sewage networks that can lead to water logging and flooding (Malakar & Mishra, 2017). Destruction or damage to infrastructure can lead to water scarcity or contamination. Lack of access to safe housing with good provision for water, sanitation, health care and education affects the capacity of urban poor households to recover(Anees *et al.*, 2020; Pandey *et al.,* 2018). Therefore, the vulnerabilities faced by the urban poor household due to climate change are largely based on the characteristics of the household (Anees *et al.,* 2020; Agyei *et al.,* 2013; Bera *et al.,* 2021).

Households generally spread resources more thinly as family size increases. A household would generally have less education expenditure per child or less per capita medical expenditure if the household size rises(Orbeta, 2005). Thus, a large family size increases the vulnerability of the household (Malakar & Mishra, 2017). However, it is also possible that a large household size entails more members available to pursue different livelihood activities which lowers the degree of vulnerability of the household (Chaudhuri, 2017). An increase in the number of persons belonging to the age group below 14 years and above 60 years reflects the greater dependency ratio for a household, which requires more resources, hence increasing the vulnerability of the household. Discrimination against women lacks the resource accessibility for the women's household in the pre as well as post-disaster situations increasing the vulnerability of the household.The education of the household members is represented by their years of schooling. It has been widely recognized that education has a

powerful impact in reducing the vulnerability of a household as it enhances the human capital base of the household empowering all the members with an increased potential for earnings in the job market and assimilating information and knowledge from various sources all of which contribute towards making the household less vulnerable. Socially marginalized populations such as SC and ST populations often struggle to access resources and social barriers.Owning a house with tenure right protects households in the post-disaster situation whereas, concrete buildings, owing private bathroom facilities and availability of electricity are the added protection against climate change vulnerability such as cyclones and floods. Financial security can augment the coping capability of people as they have access to valuable resources. Better income for the individual household helps in faster recovery in the post-disaster phase.Technology can play an important role in collecting and disseminating information both prior to and post-disaster. All indicators i.e., access to radio, television, laptop and phone are indubitably going to reduce losses as compared to someone without access to these. On the other hand, stagnant water and the existence of human or animal excretion induces health hazards after the floods and ultimately results in the loss of assets. Surrounding the household with stagnant water and open excretion causes the vulnerability to increase for the marginalised household in urban areas.

Table 1: Factors determining climate vulnerabilities based on household characteristics

Factors	**Indicators**	**Reference**	**Expected effect on vulnerability**
Social	Household size	(Anees *et al.*, 2020; Chaudhuri, 2017; Pandey *et al.*, 2018)	+/-
	Number of persons above 60 years	(Anees *et al.*, 2020; Pandey *et al.*, 2018)	+
	Number of persons below 14 years	(Anees *et al.*, 2020; Malakar & Mishra, 2017)	+
	Dependency ratio	(Pandey *et al.*, 2018)	
	Female population	(Anees *et al.*, 2020)	+
	Households belonging to SC, ST, OBC	(Malakar & Mishra, 2017)	+
	Education level of the household head	(Anees *et al.*, 2020; Malakar & Mishra, 2017)	-
Infrastructural	House owned	(Anees *et al.*, 2020; Pandey et al., 2018)	-
	Concrete House	(Anees *et al.*, 2020; Pandey et al., 2018)	-
	Access to electricity	(Malakar & Mishra, 2017)	-
	Toilet owned by the	(Anees *et al.*, 2020; Malakar	-

	household	&Mishra, 2017)	
	Access to PDS	(Bera *et al.*, 2021; Pandey et al., 2018)	-
Financial	Total income	(Anees *et al.*, 2020)	-
	Access to the financial institution	(Anees *et al.*, 2020)	-
Technological	Access to mass media such as television, radio, internet etc.,	(Brenkert& Malone, 2005; Malakar & Mishra, 2017)	-
Environmental	Stagnant water	(Gupta *et al.*, 2019; Pandey *et al.*, 2018)	+
	Human/ animal excrement	(Gupta *et al.*, 2019; Pandey *et al.*, 2018)	+

Source: Author's compilation

2. Data and Methodology

This paper uses the urban sub-set of nationally representative IHDS data collected in 2011-2012. The IHDS covered 42,152 households located across 33 (now 34) states and union territories (UTs) of India, excluding Andaman and Nicobar Islands and Lakshadweep Islandduring 2011-12. The IHDS data is nationally representative multi-topic panel data that surveyed 42,152 households. Specification of variables from the data set and appropriate methodology is explained in the following section.

3.1 Data

This study reviews extensive literature to identify the indicators of climate change vulnerability of the urban poor household in India. The emphasis of selecting indicators was to cover aspects of the household's demographic and socio-economic features which affect the vulnerability the most (Brenkert& Malone, 2005). As the current study focuses on 14, 573 urban households which counts for 35percentage of the total data set. The IHDS database also identified poor and non-poor households on the basis of the poverty line specified by the Tendulkar committee[4], 2012. 10percentage among the total urban household reported living below the poverty line.

[4]The IHDS data has classified economic status of the household by poverty line and below poverty line is identified as the households whose per capita expenditure is below Rs. 47.

Table 2: Urban sample household specification of IHDS data, 2011-12

Specification of data	**Figures in percentage***
Percentage of urban household	35 (14,573)
Percentage of households living in six metro cities	22 (3169)
Percentage of households living below the poverty line in urban area	10 (1481)
Percentage of households living below the poverty line in metro cities	10 (149)
Percentage of poor urban household facing climate vulnerability	3 (37)

*Note 1: Figures in the parenthesis indicates the absolute numbers
Source: Author's calculation on the basis of IHDS data, 2011-12

The IHDS data contained information about socio-economic, demographic indicators, infrastructure, employability opportunities and wage rates, availability of social services including education, health, etc., other income sources, accessibility to financial institutions and social relations. The data also included the indicator of major risks related to climate change faced by the households in India interms of the major expenditure accounted by the households due to climatic events such as drought, flood and fire incidents.The IHDS database included a broad range of economic questions and collected a set of questions about access to different public provisions by the urban households. The IHDS data contained household level information about socio-economic, demographic indicators, infrastructure and employability opportunities. We focus on the extent to which women-empowerment at the village level over the preference for clean cooking fuel. The paper is not trying to establish the causality between climate vulnerability and accessibility to public provision. Rather the paper tries to examine how the accessibility to public provision helps the urban poor households to mitigate climate vulnerabilities. The paper is also an unbiased attempt to measure how public provision helps in enhancing adaptive capacity due climate variability of urban poor households in Kolkata.With the specification of the data set the next subsection will try to explain possible methodology to identify the determinants of the climate change vulnerability faced by urban poor household in India.

3.2 Methodology

The dependent variable, CV_i is a binominal variable that indicates the climate vulnerability faced by the representative households. The climate change vulnerability is indicated as the major expenditure incurred during last five years due to drought, flood and fire incidents faced by urban poor household in the survey period. If the major expenditure is incurred by the households, that implies the household has faced the climate vulnerability and the CV_i will be equal to 1, 0 otherwise. The key independent variables are access to different public provisions which includes productive assets, housing, electricity safe drinking water, sanitation, Public Distribution System (PDS) shops and clean local environment. The study further includes independent variables such as economic status of households that is whether the household belongs to the poor category or non-poor category. Apart from the indicators of the access to different public provisions, we also control for other factors that can potentially influence the probability of being vulnerable to climate at household level. These include characteristics of the households like age of the household head, dependency ratio, caste, highest education attainment, income and primary source of income. The description of the variables is given in the appendix.

As the dependent variable is binary in nature and with the assumption of normal distribution, the study considers probit model specification. Marginal effects estimate from the probit regression model allows to explain the contribution to change in the probability of climate vulnerability of a representative households due to change in access to public provisions. In the following section, we estimate a probit regression model predicting the climate vulnerability of households given the access to public provisions (Equation (1)) as follows.

$$CV_i=\alpha_i+\beta_iX_i+\delta_iZ_i \quad \text{……..(1)}$$

Wher ei denotes eligible villages. CVi represents the dependent variable, climate vulnerability; Xi represents the key independent variables representing access to different public provision; while Zi represents a set of additional explanatory variables, controlling for household-level characteristics. βi and δi are parameters to be estimated. Interestingly, climate vulnerability of representative households may be affected by many unobserved factors that are not easy to control and household characteristics may also be affected by vulnerability instead of the reverse. For example, access to public provisions may reduce vulnerability burden increasing ability to participate in the labour market and earnings instead of the other way around. The effect of economic status and access to public provisions are

also not easy to distinguish in this case. We address these challenges via several robustness checks as explained in the following sections. We carry robustness checks by considering different types ofmodels of the limited dependent variable.The next section deals with the findings and their implications.

3. Findings and implications

Our empirical analysis investigates the determinants of the probable climate vulnerability of households, which can explain the possible requirement of resource allocation for supporting government intervention. This study provides a baseline understanding of the role of public provision towards mitigating probable climate vulnerability of the households in India by using the probit regression model. The regression result is summarised in the appendix.

For the various kinds of econometric models tested on the data set, we get access to public provisions like productive assets, housing condition, sanitation and clean local environment are the significant variables along with education and economic status of the households. Apart from these variables, three other covariates – access to electricity, access to safe drinking water and access to PDS are correlated with the probability of climate vulnerability, however, they are not statistically significant. The study checked the robustness of the empirical model by comparing it with other models. The statistically significant variables are the same across the model and it seems that the probit model is the best-fitted model. These results seem to be robust to controls for potential endogeneity. The model provides the estimated probabilities ranges from 3 percentage to 57 percentage, making it useful to conclude that the climate vulnerability of urban households largely varies.

The regression analysis also shows the marginal impact of the covariates on the probability of climate vulnerability due to access to different public provisions. The public policies are identified to contribute a 5 percent change in the probability of climate vulnerability. whereas income variable itself contributes 5 percent change in the probability of climate vulnerability. Income plays an important role in vulnerability as seen consistently in the literature, however, it contributes very little to the probability of the climate vulnerability in the empirical model. Public facilities like access to PDS and safe housing conditions are contributing more to the change in probability of climate vulnerability. On the other hand, higher education and higher caste are also contributing more to the change in probability of climate vulnerability.Interestingly, higher education, higher caste and households with higher income are significantly positively related to the change in probability of climate vulnerability. This

is possibly due to the endogeneity problem between households' income and probability of climate vulnerability; however, that is not the focus area of discussion in this article.

Household livelihood strategies for coping with climate change vulnerabilities are determined by the accumulation and allocation of resources. Public provisions provided by local governance or civil society or non-governmental organisations provide resources to build the livelihood strategies. For example, a household with prior knowledge regarding climate risk can enhance adaptive capacity more than households without the proper knowledge of climate-related risks. Therefore, vulnerability differs based on a household's resource accessibility and policy and planning needs to look into vulnerability assessment based on households' access to public provisions. The above results show that in India urban poor households with better access to public provisions like education, employability, sanitation, food security, electricity services are less exposed to climate-induced vulnerabilities. In particular, the study identifies that the public provisions can help to secure social and economic vulnerabilities to climate variability and change in urban poor households in India. The results are important in developing smart and climate resilient urban India.

4. Summary and conclusion

Responses to global emergencies like climate change must have justice at their core because the poor and marginalised section suffer more than the others. Urban poor, residing in hazardous and eco-fragile areas such as river-beds, tank beds, and banks of drains make their livelihoods more vulnerable to extreme climatic shocks such as heavy rainfall, flood, drought and cyclones. Therefore, the climate shocks such as cyclones, droughts and floods affect the livelihoods of the urban poor and marginalised households by intersecting with multiple dimensions of poverty and informality such as inadequate income, poor housing conditions and lower asset base which demands more research on climate change vulnerability assessment of the urban poor in India. Therefore, the current study aims to evaluate the access to public provisions like education, employability, sanitation, food security, electricity services and probability to get exposed to climate-induced vulnerabilities of the urban poor household in India. In particular, the study is trying to discuss how the public provisions could help to secure social and economic vulnerabilities to climate variability and change in urban poor households in India.

The distribution and accumulation of resources influence household livelihood strategies for mitigating the effects of climate change. Resources for developing livelihood strategies are made available by public initiatives offered by non-governmental organizations, civil society, or local government. Households that possess prior knowledge about climate risk, for instance, are better able to increase their adaptive capacity than those that do not. As a result, vulnerability varies depending on how easily a household can access resources, and policy and planning must consider how households can access public resources when assessing

vulnerability. The data analysis indicates that urban impoverished households in India are less vulnerable to climate-related risks when they have greater access to public services like employment opportunities, sanitation, food security, and education. Specifically, the study finds that social and economic vulnerabilities in urban poor households in India can be protected by public provisions against climate variability and change. When the state is thinking about climate justice and climate governance in relation to climatic extreme events, this is socially and politically significant. Communities in urban areas can be protected and strengthened through the development of livelihood frameworks that are based on access to public resources. Leveraging this aspect in addition to their lower contribution to overall GHG emissions can introduce the idea of fair provision of public facilities between the different income class of urban agglomeration to abate the climate injustice.

Besides seeking solutions, stronger and collective political advocacy is equally needed from the Global South to counterbalance the social injustices that come from uneven climate impact. The urban area collectively holds immense potential in its ability to combat climate change through its possession of large contributions to economic activities and that act as an important resilient community.

Appendix

A.1. Description of Variable

Indicators	Variables	Nature of the variable	Indicators
Social Indicators	Dependency ratio	Continuous	Ratio of total number of dependent to independent household
	Caste	Categorical	Household belongs to SC, ST and OBC (Base)
			Household belongs to the general caste
			Household belongs to brahmin
	Education	Categorical	Household head is illiterate (Base)
			Up to primary education
			Up to secondary education
			Above secondary
	Age	Discrete	Age of the household head
Financial Indicators	Economic status	Dummy	Household belongs to below poverty line (Base)
			Household belongs above poverty line
	Income	Continuous	Net annual income of the household
	Primary source of income	Dummy	The nature of employment of household head is informal (Base)
			The Nature of employment of household head is formal
Infrastructural Indicators	Housing condition	Dummy	Kutcha (Base)
			Pucca
	Productive asset possessed by household	Discrete	Number of consumer goods possess by the household
	Access to PDS	Dummy	Household has the access to PDS (Base)
			Household has no access to PDS
	Provision of electricity	Dummy	Household has no access to electricity (Base)
			Household has access to electricity
	Access to drinking water	Dummy	Household has no access to drinking water (Base)

			Household has access to drinking water
	Provision of sanitation	Dummy	Household has no toilet facility (Base)
			Household has toilet facility
	Environmental condition	Dummy	Stagnant water beside the house of the household (Base)
			No stagnant water beside the house of the household

A.2. Table: Regression Results

Variables	Indicators	Marginal effects of covariates
Dependency ratio	Ratio of total number of dependent to independent household	-0.0122 (0.0005)
Caste	Household belongs to general (Base)	
	Household belongs to brahmin except general	-0.0048 (0.1280)
	Household belongs to OBC	0.0139*** (0.0635)
	Household belongs to SC	-0.0031 (0.0872)
	Household belongs to ST	0.0222* (0.1260)
	Others	0.0360** (0.1553)
Education	Household head is illiterate (Base)	
	Up to primary education	0.0124* (0.1372)
	Up to secondary education	0.0104

		(0.1076)
	Above secondary	0.0231*** (0.1164)
Age	Age of the household head	-0.0001 (0.0020)
Economic status	Household belongs to below poverty line (Base)	
	Household belongs above poverty line	-0.0114** (0.0914)
Income	Net annual income of the household	-0.0006*** (0.0030)
Primary source of income	The nature of employment of household head is informal (Base)	
	The Nature of employment of household head is formal	-0.0084** (0.0575)
Housing condition	Kutcha (Base)	
	Pucca	-0.0064** (0.0638)
Productive asset possessed by household	Number of consumer goods possess by the household	-0.0007*** (0.0073)
PDS accessibility	Household has no access to PDS (Base)	
	Households has access to PDS	-0.0123*** (0.0593)
Provision of electricity	Household has no access to electricity (Base)	
	Household has access to electricity	-0.0096* (0.1471)
Access to drinking water	Household has no access to drinking water (Base)	
	Household has access to drinking water	-0.0013*** (0.0933)
Provision of sanitation	Household has no toilet facility (Base)	

	Household has toilet facility	-0.0029** (0.0726)
Environmental condition	Stagnant water beside the house of the household (Base)	
	No stagnant water beside the house of the household	-0.0127*** (0.0686)

Predicted Probability: 0.0301

Note: 1. Standard errors are indicated in the parenthesis
2. ***, **, and * denote statistical significance at the 1%, 5% and 10% levels, respectively
Source: Author's calculation

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