



DATA FOR DEVELOPMENT

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Does Irrigation Access Improve Diets of Farming Households?

Abhishek Rajan & Olesya M. Savchenko



Irrigation is a key agricultural input that can influence nutrition through production and income pathways, yet its role in shaping diets remains underexamined. The paper examines the effects of irrigation on food consumption and diet quality among farming households using data from the India Human Development Survey Round II (2011–12). The authors find that irrigation adoption increases the consumption of milk, wheat, and sugar, but has limited or no effect on the consumption of nutrient-rich foods

such as vegetables, fruits, legumes, eggs, and meat. Groundwater irrigation has stronger effects on the consumption of nutrient-dense foods than surface-water irrigation. The findings highlight the need for nutrition-sensitive irrigation policies to improve access to healthier and more diverse diets.

Table 1: ATT of Irrigation on Consumption of Different Food Items

	Quantity Consumed (kg/month)		Value Consumed (INR/month)	
	Kernel Matching (1)	Mahalanobis Distance Matching (2)	Kernel Matching (3)	Mahalanobis Distance Matching (4)
Wheat	+3.86*** (0.63)	+3.09*** (0.65)	+47.39*** (8.84)	+34.42*** (8.42)
Milk	+5.11*** (1.33)	+3.16* (1.62)	+84.45** (39.10)	+42 (52.35)
Sugar	+0.47*** (0.13)	+0.44*** (0.15)	+15.04*** (4.49)	14.58*** (5.17)
Oil	+0.03 (0.08)	+0.02 (0.08)	+3.10 (6.82)	+4.60 (6.8)
Legumes	+0.06 (0.10)	0.06 (0.10)	+0.47 (5.03)	+5.08 (5.81)
Coarse Cereals	-1.14*** (0.36)	-0.97*** (0.23)	-8.92* (4.18)	-8.18 (3.41)
Rice	-0.03 (0.60)	-0.33 (0.69)	-18.25 (11.36)	-13.43 (11.36)
Meat	+0.03 (0.05)	+0.04 (0.05)	+0.44 (10.23)	+3.1 (10.60)
Egg	+0.27 (0.30)	+0.96 (1.60)	+0.61 (1.88)	+1.16 (1.94)
Vegetables	-	-	+16.8 (10.9)	+25.54** (10.83)
Fruits	-	-	-5.75 (10.17)	-5.6 (9.1)
No. of Observations	12,418	12,418	12,418	12,418
State Dummies	Yes	Yes	Yes	Yes

Source: Authors' calculations based on IHDS II (2011-12).

Notes: PSM coefficients using KM and MDM with state-level fixed effects are reported. Bootstrapped standard errors with 100 replications are reported in parentheses. For KM, the Epanechnikov kernel is used with a bandwidth selected using cross-validation. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.1 levels.

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About the Authors



Abhishek Rajan is a Postdoctoral Researcher at Texas A&M University. He holds a Ph.D. in Applied Economics from the University of Florida. His research focuses on water resource management and pro-environmental behaviour. He has also been affiliated with the International Water Management Institute (IWMI), a CGIAR research centre.



Olesya Savchenko is an Associate Professor of Agricultural Economics and Policy in the Food and Resource Economics Department at the University of Florida. She holds a Ph.D. in Applied Economics from the University of Illinois and completed a postdoctoral fellowship at the University of Delaware's Center for Experimental and Applied Economics.

Leveraging Networks to Access Basic Services: Understanding Preference for Patronage and Collective Action Networks Based on Housing Precarity

Amrita Vijay Jain, Aishwarya Borate

This study examines how housing precarity shapes the ways urban households in India use social networks to access basic services. Using data from the India Human Development Survey Round II (2011–12), the study analyses 13,174 urban households in a multi-group structural equation model where patronage networks and collective action networks mediate the effect of socioeconomic characteristics on access to water, electricity, sanitation, and cooking gas. Moving beyond the conventional distinction between formal and informal housing, the study measures housing precarity using the materials used to



construct household walls and roofs. The findings show that 22.4 percent of urban households live in materially precarious dwellings, compared with only 2.5 percent classified as informal—highlighting a substantial gap that conventional formal–informal measures may overlook. Precarious households rely more on both types of social networks, with a stronger reliance on collective action networks. Income and education generate greater network-mediated benefits for these households, while caste and length of residence have a more limited role in shaping network formation.

Table 2: Informality and Precarity of Housing Structure in the IHDS dataset

	Formal	Informal	Total
Precarious	2,781 (21.14%)	162 (1.23%)	2,943 (22.37%)
Non-precarius	10,049 (76.39%)	163 (1.24%)	10,212 (77.63%)
Total	12,830 (97.53%)	325 (2.47%)	13,155

Source: Authors' calculations based on IHDS II (2011-12).
Notes: Informal - Chawl and Slum type of housing
Formal - House with no shared walls, House with shared walls, and a Flat
Precarious structure - Houses with either the roof, the walls, or both are made of precarious materials
Non-precarius structure - Houses with walls and roofs made of non-precarius materials.



About the Authors



Amrita Vijay Jain is a Senior Researcher at the Minnesota Statistical Analysis Center, St Paul. She holds a PhD in Urban Planning and Public Policy from the University of California, Irvine, and her research focuses on housing access and affordability. Her recent work has appeared in Social Sciences and Humanities Open (2026) and Urban Geography (2025).



Aishwarya Borate is a Research Scientist at the ByWater Institute, where she works on hazard mitigation, climate adaptation, community resilience, and population change across Louisiana and the Gulf Coast. Her research examines drivers of coastal out-migration in the Lower Mississippi Delta using mixed methods combining advanced statistical techniques, qualitative analysis, and GIS.

Recent Publications Using IHDS Data

Das, M., & Kumar, M. (2026). Borrowing-induced Impoverishment Associated with Non-communicable Diseases among Indian States using Human Development Survey Data. Discov Sustain.

Desai, S., & Choudhury, P. (2026). India's Occupational Transformation: A Tale of Two Escalators. In K. Basu, S. Desai, A. Deshpande, & N. Singh (Eds.), The Indian Economy: Navigating a Global Turning Point. S&S India.

Dutt, S. (2026). Essays in Institutions, Segregation and Inequality in India. [Doctoral Dissertation, Boston University]. ProQuest Dissertations & Theses.

George, M., Clarke, L., Hultman, N., Pachauri, S., Patwardhan, A., Pelz, S., & Mcjeon, H. (2026). Different Dimensions, Different Vulnerabilities: Intersectional Energy Poverty in India. Energy Research & Social Science, 140, 104930.

Karmakar, S., Dasgupta, S., & Mahato, R. K. (2026). On Measurement & Sub-National Inequality of Social Capital in India: An Analysis Based on IHDS-II Survey Data. International Journal of Social Science Research (IJSSR), 3(4), 588–597.

Kumar, D., & Sengupta, S. (2026). Employment Trajectories and Alcohol Consumption in India: Longitudinal Evidence from the India Human Development Survey. Addiction Research & Theory, 1-11.

Mahesh, M. (2026). Crime and Credit Constraints: Evidence from a Microfinance Crisis in India. The Indian Economic Journal.

Mullick, A. (2026). Essays on Children's Human Capital Formation and Mental Well-Being of the Elderly. [Doctoral Dissertation, State University of New York at Binghamton]. ProQuest Dissertations & Theses.

About IHDS

The India Human Development Survey (IHDS) began as a nationally representative, multi-topic survey of 41,554 households in 1,503 villages and 971 urban neighbourhoods across India. The first round of interviews were completed in 2004-05; the Data is publicly available via ICPSR. The second round re-interviewed most of these households in 2011-12 (N = 42,152), and data for the same are available via ICPSR. Fieldwork for IHDS-III was undertaken in 2022-24, and data is currently being cleaned and processed.

The IHDS-III has been jointly conducted by researchers from the University of Maryland, the National Council of Applied Economic Research, Indiana University and the University of Michigan.

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