Education and adaptive capacity to climate risk

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Research Question

Does being educated leads to an improved ability to respond to current climate risks, for example, tropical cyclone hazard?

Insights from existing studies

➢ Generally positive correlation has been found between education and positive life outcomes (income, health, well-being etc.) though question of causality remains unresolved ('human capital accumulation' theories vs. 'signaling' theories)

➢ Education in disasters and climate change research – mixed findings on effect of education in reducing adverse impacts

Education expected to affect ability to respond to tropical cyclone hazard through

➢ Better access to and understanding of relevant risk information

➢ Through its effect on other factors which help in response such as income, socio-economic status etc.

Methodology

➢ Household level large sample survey using a structured questionnaire

➢ Cyclonic events – 2005 and 2006 in Krishna, Nagapattinam and Guntur districts respectively.

➢ Data collection
  • Large sample survey – questionnaires administered orally to 237 individuals across 34 villages in 5 affected districts.

➢ Data analysis
  • Logit regression and various statistical tests

Location of study area

Andhra Pradesh

Tamil Nadu

Guntur Krishna

Prakasam

Bay of Bengal

Cuddalore

Nagapattinam

Nagapattinam

Bay of Bengal

Sample Characteristics

- 212 usable responses

- Gender: 61% male and 39% female respondents

- Age: Ranged from 18 to 80 years; mean age 36 years

- Income: Ranged from INR 3000 to INR 60000 p.a.; median income INR 12000 p.a.

- Education: Ranged from 0 to 17 years; median 7 years of education

Appropriateness of response

Response		Count	Percent
Evacuation	Not Evacuated	75	35.4
	Evacuated	137	64.6
Voluntary evacuation	Not Evacuated	89	42
	Evacuated	123	58
Voluntary shelter evacuation	Not Evacuated	118	55.7
	Evacuated	94	44.3

Less

Appropriateness

More

Distribution of respondents based on education

Number of years of education	Number of respondents
0 years (Illiterate)	43
1 to 10 years	127
11 to 17 years	42

Education and evacuation

	Evacuation	Voluntary evacuation	Voluntary shelter evacuation
Number of years of education	1.055*	1.051*	0.998
Education between 1 to 10 years (Categorical)	1.006	0.804	0.619
Education between 11 to 17 years (Categorical)	2.779**	2.304*	1.05

The figures reported are odds ratios.
*** denotes ≤ 0.01; ** denotes ≤ 0.05 and * denotes ≤ 0.10 level of significance

Evacuation predictors

	Evacuation predictors		
Socio-economic and demographic characteristics	Age	**Social environment cues**	Friends and neighbors evacuating
			Community members evacuating
	Gender	**Physical environmental cues**	Predicting cyclone occurrence based on environmental precursors
	Income	**Knowledge**	Estimate of damage due to cyclone of a particular severity
	Housing Quality	**Past evacuation experience**	Evacuated in previous cyclones
Warning message characteristics	Severity of cyclone		Relief shelter stay quality (whether basic amenities met)
	Landfall Location of cyclone	**Cognitions and biases**	Perception of safety during evacuation
	Landfall time of cyclone		Self efficacy in saving livelihood assets
	Evacuation order in the warning		
	Protective guidance in the warning		Fear of looting
	Type of channel		

Evacuation predictors explaining evacuation for different levels of education

	Evacuation predictors	Voluntary shelter evacuation			
		Total (N= 212)	Illiterate (N=43)	Educated 1 to 10 (N=127)	Educated 11 to 17 (N=42)
Socio-economic and demographic characteristics	Age	1	1.03	0.99	1.01
	Gender	1.45	2.93*	1.07	2.13
	Income	1	1	1	1
	Housing Quality	0.74	3.2*	0.57	0.36
Warning message characteristics	Severity of cyclone	2.42***	2.43	3.13**	1.83
	Landfall Location of cyclone	2.61***	2.55	2.91**	2.27
	Landfall time of cyclone	2.35***	2.55	2.66**	1.75
	Evacuation order in the warning	1.51	1.41	1.83	1.5
	Protective guidance in the warning	2.28***	2.36	2.64**	1.75
	Type of channel	0.83	0.23**	1.07	1.46

Social environment cues	Friends and neighbors evacuating	4.9***	8.5***	3.46***	8.36***
	Community members evacuating	4.1***	4.54**	3.42***	6.33**
Physical environmental cues	Predicting cyclone occurrence based on environmental precursors	1.75**	1.38	2.42**	1.18
Knowledge	Estimate of damage due to cyclone of a particular severity	1.73**	2.89*	1.58	1.25
Past evacuation experience	Evacuated in previous cyclones	1.47**	1.85*	1.37**	1.37**
	Relief shelter stay quality (whether basic amenities met)	3.06***	6**	2.51**	3.22*
Cognitions and biases	Perception of safety during evacuation	2.31***	0.76	4.22***	3.33*
	Self efficacy in saving livelihood assets	2.28***	1.59	2.58**	2.33
	Fear of looting	1.34	0.35*	2.35**	1.09

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Non-formal education – traditional knowledge base

➢ Could explain some counter-intuitive findings

➢ On the whole lesser proportion of illiterate respondents and respondents with higher level of education possessed traditional knowledge base for predicting cyclones based on environmental pre-cursors (Chi sq statistic: 5.69*)

➢ Analysis of data regarding this aspect ongoing

Traditional Knowledge base and evacuation

	Evacuation	Voluntary evacuation	Voluntary shelter evacuation
Traditional knowledge base	1.914**	2.384***	1.743**

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Evacuation predictors explaining evacuation for different levels of TKB

	Evacuation predictors	Voluntary shelter evacuation		
		Total (N= 212)	Without TKB (N=43)	With TKB (N=42)
Socio-economic and demographic characteristics	Age	1	1.017	0.992
	Gender	1.45	1.909	1.192
	Income	1	0.999	1
	Housing Quality	0.74	1	0.6
Warning message characteristics	Severity of cyclone	2.42***	1.154	5.437***
	Landfall Location of cyclone	2.61***	1.685	3.8***
	Landfall time of cyclone	2.35***	1.375	3.8***
	Evacuation order in the warning	1.51	1.148	1.774
	Protective guidance in the warning	2.28***	2.981**	1.719
	Type of channel	0.83	0.697	0.884

Evacuation predictors explaining evacuation for different levels of TKB

Social environment cues	Friends and neighbors evacuating	4.9***	3.938***	5.514***
	Community members evacuating	4.1***	2.546***	6.462***
Knowledge	Estimate of damage due to cyclone of a particular severity	1.73**	1.041	3.069**
Past evacuation experience	Evacuated in previous cyclones	1.47**	2.078***	1.24*
	Relief shelter stay quality (whether basic amenities met)	3.06***	7.965***	1.8
Cognitions and biases	Perception of safety during evacuation	2.31***	1.233	3.889***
	Self efficacy in saving livelihood assets	2.28***	1.455	2.857**
	Fear of looting	1.34	0.593	2.857**

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