

**GENDERED VULNERABILITY OF COASTAL FISHER
COMMUNITIES TO CLIMATE HAZARDS IN KERALA STATE,
INDIA**

Dr.Aswathy Natarajan

Principal Scientist

**ICAR-Central Marine Fisheries Research institute,
India**

Problem focus

United Nations Framework Convention on Climate Change (UNFCCC) identified the state of Kerala as one of the climate vulnerable hotspots threatened by extreme events. The Indian Network for Climate Change Assessment (INCCA) projected that one meter sea level rise could inundate 169 sq. km of the coastal region surrounding Ernakulam district in Kerala.

Coastal fisher communities are highly vulnerable to climate change considering their dependence on fishery based livelihoods, depletion of marine resources, low resource possession, lack of fishing rights and other environmental hazards.

Women in the developing countries experience the impacts of climate hazards more because of their low socio-economic status, low livelihood asset ownership and gendered division of rights and responsibilities.

Very limited studies focussing on gender specific vulnerability to climate hazards in fisheries sector

Objective :To assess the gendered vulnerability of coastal fisher communities

Study area: Ernakulam district of Kerala



Methods

The livelihood vulnerability assessment is done based on the sustainable livelihoods framework - the livelihood activities practiced depend on the livelihood assets owned, controlled or accessed by the households such as human, physical, natural, social and financial.

The respondents consisted of male headed and female headed households of small scale fisher communities residing in the marine fishing villages of Ernakulum district.

A male headed household is the one in which the primary decision maker is a male.

A female headed household is the one in which the primary decision maker is female (widows, unmarried, married but separated or divorced, or whose husbands stay away from the house for more than 6 months).

The LVI index was constructed based on 9 major components- socio-demographic particulars, livelihood strategies, health status, access to water, access to food, social capital, natural and physical capital, financial capital and natural disasters and climate variability

The livelihood vulnerability based on composite index

Each subcomponent in the LVI was measured in different scales and hence standardisation of the index was done (Hahn *et al.*, 2009)

$$\text{Index}_{sc} = \frac{S_a - S_{\min}}{S_{\max} - S_{\min}}$$

Where S_a is the actual value of the component in the sample category, S_{\max} is the maximum value of the component in the total sample and S_{\min} is the minimum value of the component in the total sample

After each was standardized, the sub-components were averaged to calculate the value of each major component.

Vulnerability index using Intergovernmental Panel on Climate Change(2014) method

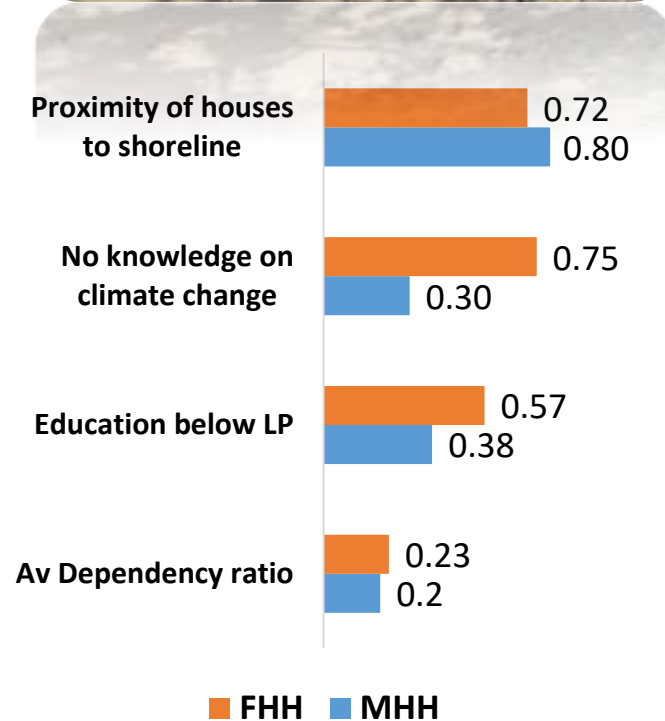
The IPCC method (2014) of computing vulnerability - contributing factors in the IPCC framework such as hazard specific sensitivity and adaptive capacity

Sensitivity included the degree to which the fishery based livelihood system is responsive to climate stimuli. Socio-demographic, food, water and health components were included.

Adaptive capacity is the capacity of the fishery based livelihood system to adjust to climate change. Adaptive capacity is influenced by infrastructure, social structure, household structure and composition, social capital (social networks and social support institutions) , knowledge, ability to access livelihood assets such as financial technological and information sources.

Results and Discussion

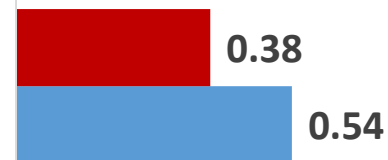
Socio-demographic and structural	Description
Proximity of dwellings to shoreline	% household located within 100m from shoreline
Education of the household head	% of households in which household head had less than primary level education
Dependency ratio	Ratio of the population <15 and >65 years to the population between 16 and 64 years
Knowledge on climate change	% of households where the head does not have knowledge of climate change



Livelihood strategies

Livelihood strategies	Description
Employment	Inverse of employed members in the household
Households without non fishery based income	% of household without any non-fishery based income source

Households without non fishery income



Inverse of total employed

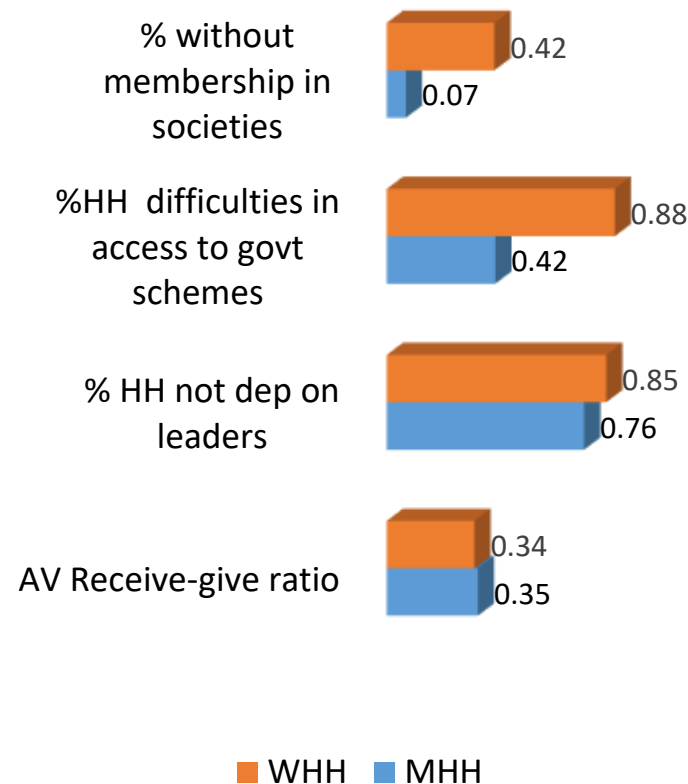


■ FHH ■ MHH

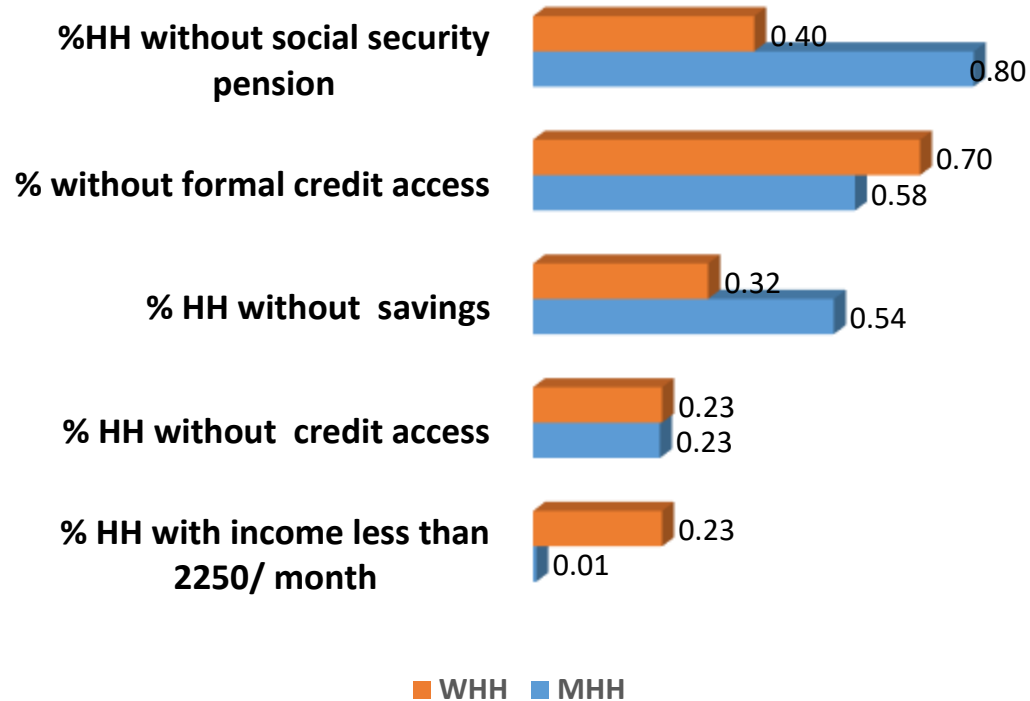


Social capital	Description
Average receive-give ratio	Ratio of the number of types of help received by the household in the past month +1 to the number of types of help given by the household in the past month+1
Households didn't approach local institutions/ leaders for assistance in the last 12 months	Percentage of households reported they haven't approached local institutions/leaders for assistance in the past 12 months
Access to government schemes	Percentage of households reported difficulties in getting government schemes
Membership in societies	Percentages of households without membership in cooperatives, fishermen societies , Self-help groups (SHGs) .

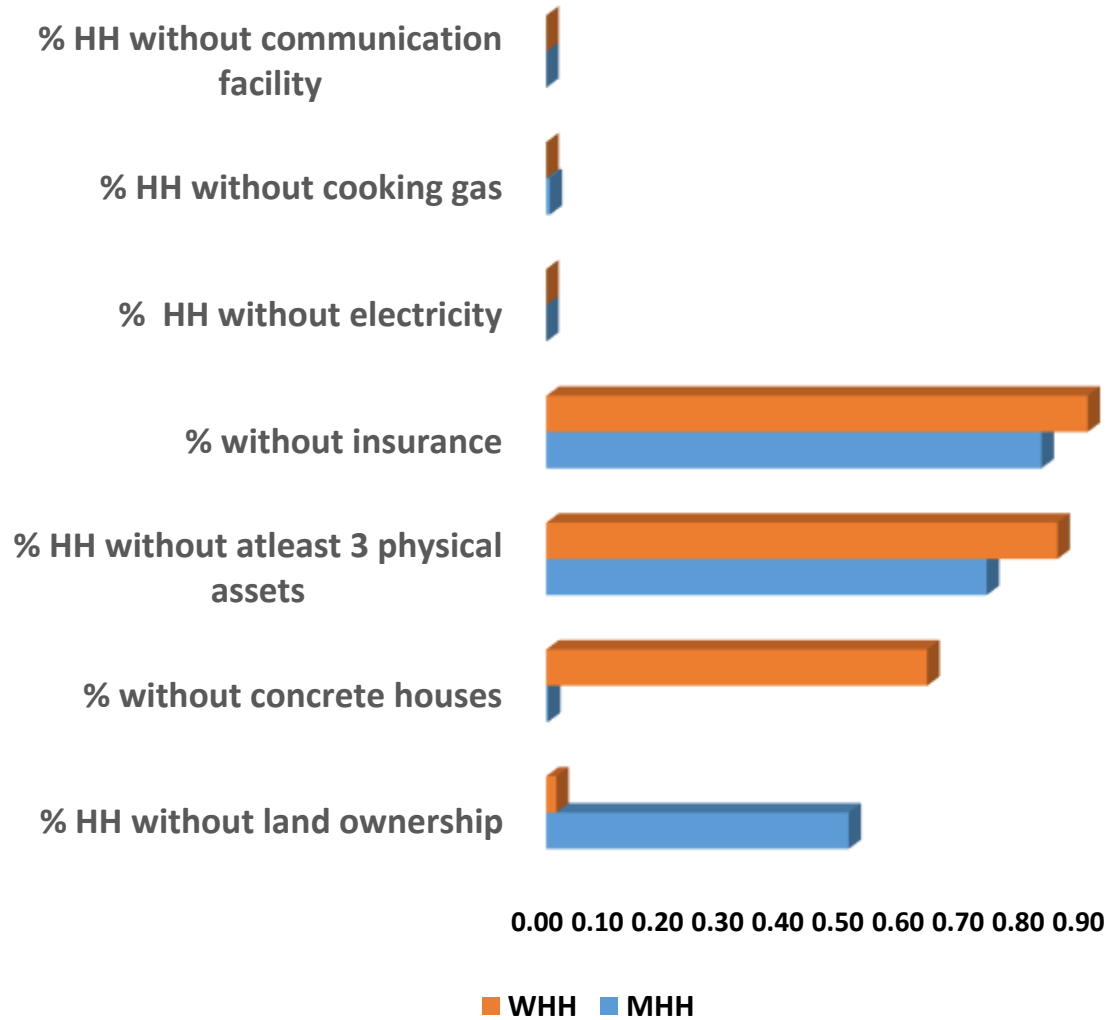
Social capital



Financial capital

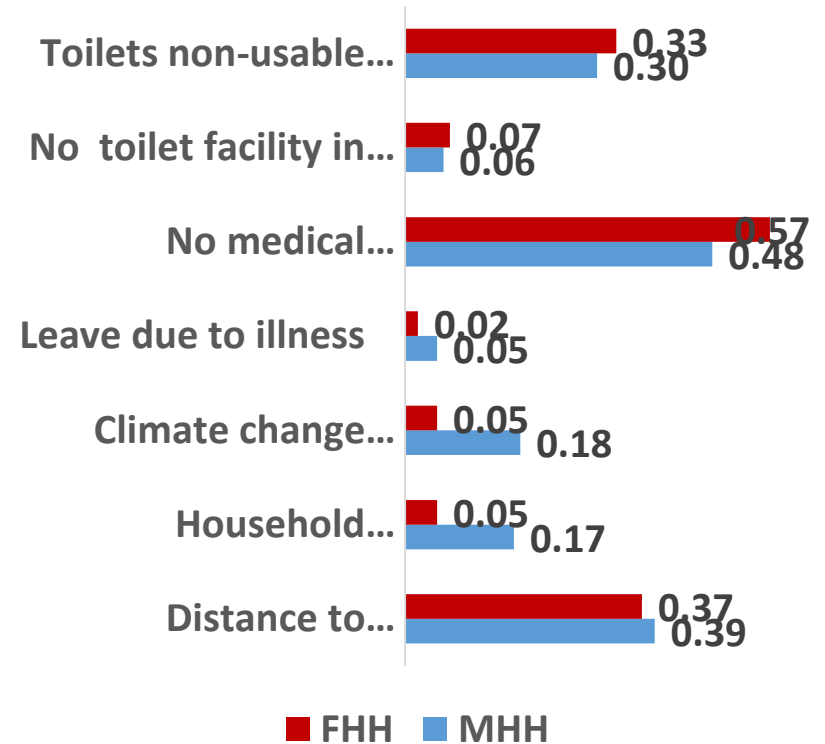


Natural and physical capital



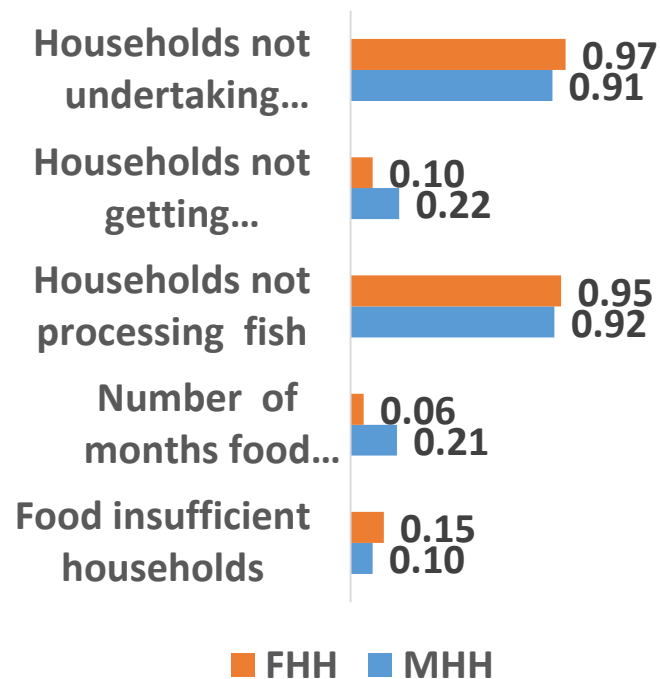
Health status

Distance to the primary health centre	Average distance to the primary health centre
Chronic illness	% households having members with chronic illness
Climate change related illness	% households a having members with climate change related illness
Leave due to illness	% households where members took leave due to illness
Medical insurance	% households with medical insurance or health card
Toilets	% household without toilets
Toilets non-usable during climate change events such as floods or sea level rise	% household where toilets become non-useable during floods



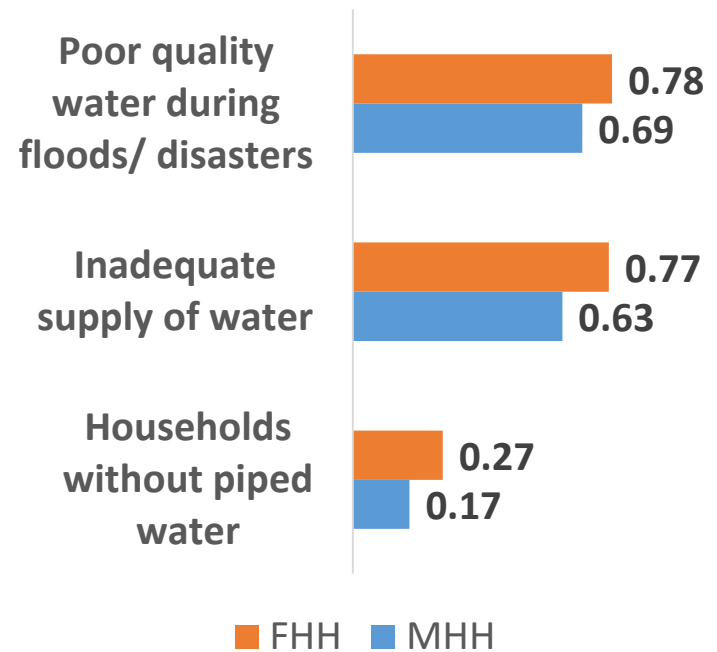
Access to food

Food sufficiency	% households which are food insufficient
Number of months food insecure	Average number of months the households are food insecure
Processing of fish	% of households not processing fish for future use
Fish consumption	% of households not getting enough fish for consumption
Farming	% households which do not undertake any farming



Access to water

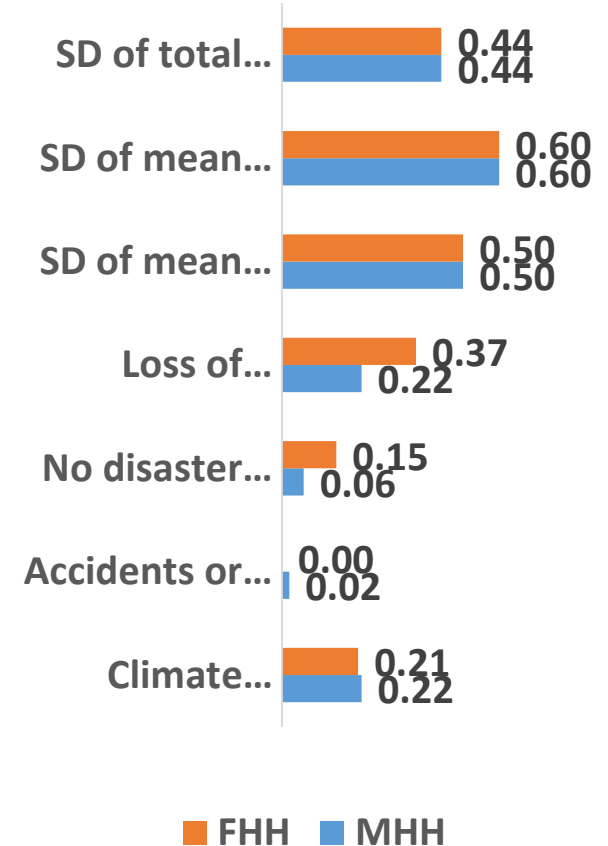
Source of water	% households without piped water for household use
Adequate supply of water	% households without adequate supply of water
Poor quality water during climate change events	% of households with receiving poor quality water during floods



Natural disasters and climate variability



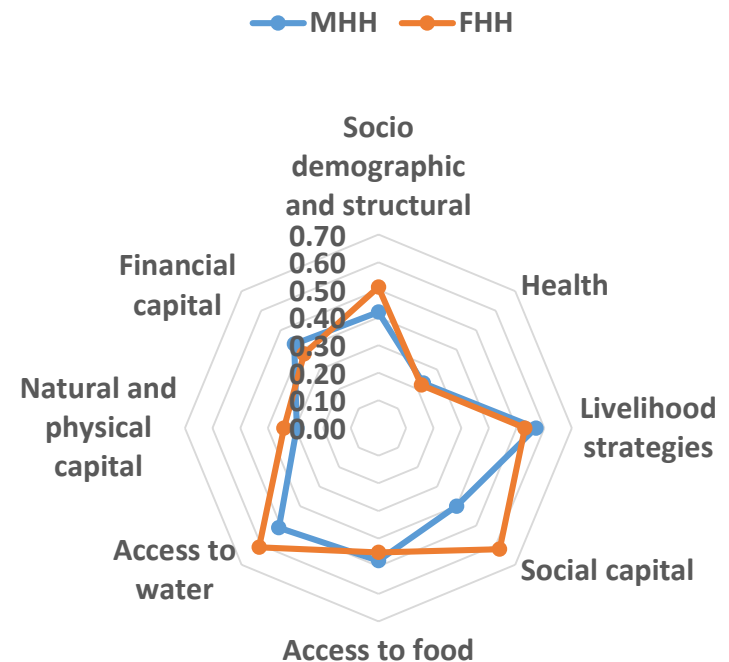
Natural disasters and climate variability	Description
Climate change events	Average climate change events in the locality
Accidents or deaths to climate change	Percent of households which had accidents or deaths of members occurred due to climate change
Warnings	Percent of households not receiving any warnings related to climate change
Loss of physical assets	Percent of households which had loss of physical assets due to climate change
Mean minimum temperature	Standard deviation of the monthly mean minimum temperature in the study area during 2010-2020 period
Mean maximum temperature	Standard deviation of the monthly mean maximum temperature in the study area during 2010-2020 period
Total rainfall	Standard deviation of the monthly total rainfall in the study area during 2010-2020 period



The female headed households showed more vulnerability with respect to socio-demographic particulars, social networks, access to water and infrastructure and financial capital than male headed households.

Female headed households in the study were dominated by older and widowed women who were less educated , had low capabilities of social networking , possessed low financial capital in terms of monthly household income, low credit access and insurance facilities which made them more vulnerable than the male headed households.

The overall vulnerability was higher for female headed households (0.41) compared to male headed households (0.37)



Livelihood vulnerability-IPCC method

Contributing factors	Components	Vulnerability Indices	
		MHH	FHH
Sensitivity	<ul style="list-style-type: none"> • Socio-demographic • Health status • Access to food • Access to water 	0.38	0.59
Adaptive capacity	<ul style="list-style-type: none"> • Livelihood strategies • Natural and physical capital • Financial capital • Social capital 	0.61	0.56
	Livelihood vulnerability index	0.15	0.26

Conclusion

- **The findings of the study showed that female headed households had higher vulnerability with respect to socio-demographic particulars, water access, social capital, etc. which suggest the need for promotion of social networks, awareness campaigns and community based adaptation measures for building the resilience of fisherwomen.**
- **Since both male headed and female headed households showed high vulnerability with respect to livelihood strategies, livelihood diversification in non-fishery based livelihoods is necessary for ensuring the livelihood sustainability of coastal communities.**
- **Female headed households in the coastal fisher communities were more vulnerable than male headed households which imply the need for gender inclusive policies in the national and state level climate change action plan**

Scope for further research

- **Very limited studies focussed on gendered vulnerability of various communities in India and coastal fisher communities in particular and there is great scope for expanding the study to other coastal districts/ states of the country**
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- **Integration of gender mainstreaming into climate change adaptation interventions and disaster mitigation measures**

Thank You