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HOUSEHOLD VULNERABILITY INDEX OF AGRARIAN FAMILIES IN TELANGANA STATE

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Abstract:

Vulnerability is the state of an entity being exposed or opposed to adverse conditions. It helps to measure the sensitivity and adaptive capacity of the households in adverse situations (Notenbaert et al, 2012; Kim & Kwon, 2022). Household vulnerability is measured in terms of condition of house, materials used for the construction, facilities available in the house etc. It helps to understand the status of house as per the changes in weather conditions in giving proper protection to the inmates of house. Thus to understand the housing conditions in providing safe security to the inmates in terms of household vulnerability index, the present study has been taken up. . A total of 160 households were selected as sample with women being the key respondents. Interview schedule was used to collect the data. Key findings were that, majority of them were living in own house with mostly single floor of 5-6 years old. It was found that household vulnerability index was 0.5 i.e. average which implies that house condition was neither best nor worst. So, the condition of house can be improved with some financial support from the government.

Key words: vulnerability, household vulnerability index, women, housing conditions

Introduction:

Women are the backbone for the development of rural and national economies. As per FAO reports, they constitute nearly 43% of the world's agricultural labor force, which rises up to 70% in some countries. In India, women constitute the largest percentage of the workforce in the agricultural sector, but do not have adequate access and control over all land and productive resources, unlike men. This places them at 'vulnerable' positions. 'Vulnerability' is the diminished capacity of an individual or a group to anticipate, copes with, resist and recover from the impact of a natural or man-made hazard.

Most of the women, mainly the farm women are vulnerable due to the exposure to contingencies and stress, and face difficulties in coping with them. They get exposed to both external (shocks and stress) and internal (defenselessness, lack of coping strategies) risks. Hence, the women need to be empowered by increasing their authority and control over the resources and decisions, mainly at the household and occupational (farm) level.

To achieve this, it is important to assess the vulnerability of women in different segments of their lives. Hence, the present study was taken up to assess the household vulnerability index of

the women in Agriculture. Vulnerability assessment is an important measure in designing, planning, implementing and evaluating the development programmes for needy people. It also helps in developing resilience (or resilient) programmes focused on economic strengthening, specifically individuals and households while community in general.

Alwang et al (2001) identified three strands within the economics literature that conceptualize vulnerability in terms of poverty dynamics, food security or sustainable livelihoods, specifying that the "literature rarely separates risk response into its reduction, mitigating and coping components".

Naude *and Paulino* (2009) created a Local Vulnerability Index using a sub-national dataset on 354 magisterial districts in South Africa. Averages across 10 selected variables from 1995 to 2005 were calculated and ranked across a nine-point index. According to this, per capita income does not have impact on vulnerability index. The results demonstrate significantly lower vulnerability to shocks in urban than rural areas. The index shed light on the vulnerability of place, particularly as it relates to environment.

Mikolai et al (2021) assessed that single parent families were more prone to financial and household vulnerability due to COVID 19 in England. Different dimensions of vulnerabilities were intersected mainly among working households.

Materials and Methods:

An exploratory research design was selected for the study. A total sample of 160 farm women from four villages (Ramachandraguda, Kalwakole, Subhanpura and Pendyal) of Maheswaram mandal in Rangareddy district of Telangana state were selected for measuring household vulnerability index. Interview schedules were developed in order to measure the household vulnerability index and women empowerment. Data was collected by in-depth semi-structured interviews, key informant interviews, observations and group discussions.

Results and Discussion:

Results of the present study were presented below

Table 1. Demographic profile of farm women

N=160

S.no	Attributes	Options	Frequency	Percentage (%)
1.	Age (years)	15-20	3	2.00
		21-30	38	24.00
		31-50	80	50.00
		51 and Above	39	24.00
2.	Gender	Male	-	-
		Female	160	100.00
3.	Education	Illiterate	104	65.00
		Primary	7	4.00
		Secondary	18	11.00

		High school	16	10.00
		Inter	9	6.00
		Degree	6	4.00
		PG	-	-
		Ph d	-	-
4.	Occupation	Farming	121	76.00
		Business	9	6.00
		Govt /Pvt Employee	3	2.00
		House wife	20	12.00
		Others	7	4.00
5.	Caste	OC	45	28.00
		OBC	72	45.00
		SC/ST	43	27.00
6.	Marital Status	Married	153	96.00
		Unmarried	-	-
		Divorce	-	-
		Widow	7	4.00

The table 1 gave the information about demographic profile of farm women. With regard to age, majority (50%) are in the age group of 31-50yrs, an equal percentage of the respondents i.e. 24% belonged to age 51 and above and 21-30yrs. A very less percentage (2%) of the sample belonged to 15-20yrs. All the respondents were females. It was interesting to note that 65% of the respondents were illiterates, 11% attended secondary school, 10% high school, 6% completed intermediate, 4% were primary educated, while 4% were graduates. With regard to occupation three-fourth (76%) were farmers, 12% homemakers, 6% were in business, 2% were employed in government and private sectors while 4% were in different kinds of occupation. With regard to caste, 45% were OBCs, 28% of them belonged to OC while 27% were SC/ST. With regard to marital status 96% were married and 4% of them were widows. It clearly implies that, farm women are either less educated or with no education and started working in the field from 31 years onwards till their late age.

Table 2. Information on living conditions

N=160

S.no	Attributes	Options	Frequency	Percentage (%)
1	Living in Maheswaram	Below 10	5	3.00
		10-20	12	7.00
		20-30	25	16.00

		30 above	118	74.00
2	Living in the village	Below 10	7	4.00
		10-20	24	15.00
		20-30	30	19.00
		30 above	99	62.00
3	Living in the house	Before 1980	8	5.00
		1980-2006	43	27.00
		2007-11	73	46.00
		After 2011	36	22.00

From the above table it could be concluded that majority (74%) of the respondents were residing in Maheshwaram for the last 30 years, while 16% were living in this district from 20-30 years. It was interesting to know from the study that, 62% of the respondents were living in the same village for above 30yrs. The study also found that 46% of the respondents were living in the same house for more than 10yrs, while 22% of the respondents were living in house for the last 10yrs while 27% were living in houses aged more than 20yrs. The results imply that, respondents are residing in 10-20 year old houses and in the same village perhaps after getting married got settled here.

Table 3. Housing Attributes of the households

N=160

S.no	Attributes		Frequency (N)	Percentage (%)
1.	Stable shelter	No stable shelter	11	6.88
		Shelter is not adequate	17	10.63
		Shelter needs some repairs	34	21.25
		Shelter is safe	98	61.25
2.	No. Of floors	Ground Floor	157	98.13
		First Floor	3	1.88
		Second Floor	-	-
		More than 3 floors	-	-
3.	No. of rooms	One room	7	4.38
		Two rooms	43	26.88
		Three rooms	44	27.50
		More than 3 rooms	66	41.25
4.	Year of Construction	Very Old	21	13.13

		Old	67	41.88
		Recent	65	40.63
		New	7	4.38
5.	Type of construction	Load bearing	3	1.88
		RCC Frame	64	40.00
		Girder slab	67	41.88
		RCC Roof	16	10.00
		GI Sheet	10	6.25
6.	Material of outer walls	Strong walls	13	8.13
		Weak walls	51	31.88
		Very weak	96	60.00
7.	Location/orientation of plot in street	Corner	36	22.50
		West Open	45	28.13
		Centre	51	31.88
		Road facing	28	17.50
8.	House in wind direction	No	18	11.25
		Yes	142	88.75
9.	Number of bed rooms	dwelling with 1 bed room	95	59.38
		dwellings with 2 to 3 bedrooms	60	37.50
		dwelling with 4 or more bedrooms	5	3.13
10.	Number of airy rooms	One room	66	41.25
		Two rooms	76	47.50
		More than 3 rooms	17	10.63
11.	Kitchen airy	No	60	37.50
		Yes	100	62.50
12.	Nature of dwelling ownership	Squatted-1	2	1.25
		Rented and leased-2	2	1.25
		Owned with mortgage-3	--	--
		Full ownership-4	156	97.50
13.	Roof's condition	Leakage	49	30.63
		Structural	111	69.38
14.	Payment and Eviction Threat	No	152	95.00
		Yes	8	5.00

From table 3, it is clear that majority (61.25%) of the respondents were having safe shelter, while 98.13 per cent were living in the ground floor with more than 3 rooms (41.25%). Equal percentage (41.88%) of the respondents were living in the same house from the year 1988-2006 and for construction girder slab was used, whereas sixty per cent of the respondents were having very weaker walls. Nearly 88.75 per cent of the respondents had proper wind direction with centre location/orientation of the house (31.88%). Highest percentage (59.38%) of the respondents were having dwelling with one bed room, two airy rooms (47.50%) and kitchen room airy (62.50%). While 97.50 per cent of the respondents were having dwelling with full ownership and structural roof's condition (69.38%). Only five per cent of the respondents were having payment and eviction threat. Since houses are 10-20 years old, one-third of the houses have problem with roof's condition and walls.

Table 4. Dwelling condition of the households

N=160

S.no	Attribute	Sub standard F (%)	Acceptable F (%)
1.	Kitchen and sanitary facilities	54 (33.75%)	106 (66.25%)
2.	Doors & Windows	51 (31.88%)	109 (68.13%)
3.	Electrical features'	41 (25.63%)	119 (74.38%)
4.	Ease access to dwelling	47 (29.38%)	113 (70.63%)
5.	Natural ventilation	50 (31.25%)	110 (68.75%)
6.	Natural lighting	51 (31.88%)	109 (68.13%)

From table 4, dwelling conditions revealed that, majority of the respondents were having acceptable kitchen and sanitary facilities (66.25%), doors, windows and natural lighting (68.13%), electrical features (74.38%), easy access to dwelling (70.63%), and natural ventilation (68.75%). Overall one-third of the houses have substandard facilities with respect to kitchen, sanitary conditions, lighting, ventilation and access to the house as they are old.

Table 5. Assets of the households

N=160

S.no	Assets	No		Yes	
		N	%	N	%
1.	Refrigerator	72	45.00	88	55.00

2.	TV	19	11.88	141	88.13
3.	Radio/Transistor/Music system	154	96.25	6	3.75
4.	AC/Cooler	157	98.13	3	1.88
5.	Washing machine	156	97.50	4	2.50
6.	Telephone with internet	106	66.25	54	33.75
7.	Mobile with data	76	47.50	84	52.50
8.	Newspaper	156	97.50	4	2.50

Finding of the study from table 5 revealed that highest percentage of the respondents were having refrigerator (55%), TV (88.13%) and mobile phone with data (52.50%). Since they own TV and mobile phone, perhaps don't purchase newspaper. Similarly labour saving device like washing machine is not owned as it consumes more electricity or they don't have proper connection facility and space in the house.

Table 6. Vehicle facilities in the households

N=160

S.no	Vehicle	Frequency (N)	Percentage (%)
1.	2 or more cars/tractors/trucks	2	1.25
2.	1 Car/tractors/trucks	7	4.38
3.	1 or more scooter(s)/ Bullock cart(s)	62	38.75
4.	1 or more cycles (not baby cycle)	32	20.00
5.	None of the above	57	35.63

Table 6 revealed that majority of the respondents were having one or more scooter/ bullock cart (38.75%) followed by respondents with no vehicles (35.63%), one or more cycles (20%), one car/tractor/truck (4.38%) and 2 or more cars/tractors/trucks (1.25%). Only negligible percentage owns a car which might be due to low income level and occupational status.

Table 7. Earning members in the family

N=160

Variables	Frequency (N)	Percentage (%)
No earning member	7	4.38
only one family member earning	62	38.75
2 or both husband and wife earning	76	47.50
3 or more members earning and income pooled	15	9.38

From Table 7 it is evident that 38.75 per cent of the households had only one member earning in the family whereas 9.38 per cent of the respondents said that three or more members were earning and had pooled income. It clearly implies that, since one or two members are earning,

their purchasing capacity is less which is evidenced through the previous tables where they don't own specialty goods like washing machine.

Table 8. Availability of Garbage facilities

N=160

Variables		Frequency (F)	Percentage (%)
Location to dispose household garbage waste	In front of the house	--	--
	Contractor collects	80	50.00
	Katchra kundi	80	50.00
	Other	--	--
Is garbage picked up daily by gram panchayat (about the waste collection service?)	No	--	--
	Yes	160	100.00

It is clear from Table 8 that eighty per cent of the respondents said that household waste was collected by contractor or thrown in katchara kundi, whereas cent per cent of the garbage waste was picked up daily by gram panchayat waste collection service. It is a good indication that no one is throwing garbage in front of the house though majority of them are illiterates.

Table 9. Household Vulnerability Index

N=160

Component	Sub component	Mean	Minimum value	Maximum value	Index	Index
Household Vulnerability	Dwelling conditions	41.93	27	56	0.5	H VI=0.5
	Assets	10.45	8	16	0.3	
	Others	9.7	3	10	0.9	

Table 9 revealed that when vulnerability index of household was calculated in terms of dwelling conditions, assets and others, the score was found to be 0.5. The study concludes that household vulnerability index 0.5 indicates that vulnerability is average. It implies that chances of getting affected or suffered due to poor conditions of houses would be average based on the construction type, materials used and present status of the house.

Table: 10. Analysis of variation for educational differences in household vulnerability dimension

Household vulnerability dimensions	Source of variation	Sum of Squares	df	Mean Square	F-value	Sig.
	Between Groups	349.407	6	58.234	3.130	.006**

Household vulnerability	Within Groups	2809.511	151	18.606		
	Total	3158.918	157			
Housing conditions	Between Groups	44.284	6	7.381	.899	.497^{NS}
	Within Groups	1239.134	151	8.206		
	Total	1283.418	157			
Electricity facility	Between Groups	2.169	6	.362	2.563	.022*
	Within Groups	21.299	151	.141		
	Total	23.468	157			
Sanitation facilities	Between Groups	38.049	6	6.342	14.246	.000**
	Within Groups	67.661	152	.445		
	Total	105.711	158			
Ventilation facilities	Between Groups	12.015	6	2.002	.939	.469 ^{NS}
	Within Groups	324.262	152	2.133		
	Total	336.277	158			
Assets	Between Groups	9.669	6	1.611	1.471	.192 ^{NS}
	Within Groups	166.570	152	1.096		
	Total	176.239	158			

**- Significant at 0.01 level,*- Significant at 0.05 level, NS- Non-Significant

H_0 1: There exists no relationship between education and household vulnerability dimension

According to the household's vulnerability dimension, Analysis of variance was performed among households. The 'F' value was found to be significant at 0.01 and 0.05 per cent levels. There was a significant difference among households with regard to household vulnerability dimension and education.

It is observed that, the educational differences in household vulnerability dimension was found to be significant at 1% level with household vulnerability, sanitation facilities and electricity facility was found to be 5 per cent level of significance. This states that, there exists a significant difference among household vulnerability, electricity facility and sanitation facilities with education. Hence, null hypothesis was rejected and alternate hypothesis was accepted for Housing conditions, Ventilation facilities and assets as they are found to be not significant. It can be inferred that vulnerability levels would be different as per educational level.

Table: 11. Analysis of variation for occupational differences in household vulnerability dimension

Household vulnerability dimension	Source of variation	Sum of Squares	df	Mean Square	F	Sig.
Household vulnerability	Between Groups	190.274	5	38.055	1.948	.090^{NS}
	Within Groups	2968.643	152	19.531		
	Total	3158.918	157			
Housing conditions	Between Groups	56.212	5	11.242	1.392	.230 ^{NS}
	Within Groups	1227.206	152	8.074		
	Total	1283.418	157			
Electricity facility	Between Groups	1.561	5	.312	2.166	.061 ^{NS}
	Within Groups	21.907	152	.144		
	Total	23.468	157			
Sanitation facilities	Between Groups	20.783	5	4.157	7.488	.000**
	Within Groups	84.928	153	.555		
	Total	105.711	158			
Ventilation	Between Groups	8.463	5	1.693	.790	.558 ^{NS}
	Within Groups	327.813	153	2.143		
	Total	336.277	158			
Assets	Between Groups	3.934	5	.787	.699	.625 ^{NS}
	Within Groups	172.305	153	1.126		
	Total	176.239	158			

**- Significant at 0.01 level,*- Significant at 0.05 level, NS- Non-Significant

H_0 2: There exists no relationship between occupation and household vulnerability dimension

According to the household's vulnerability dimension, Analysis of variance was performed among households. The 'F' value was found to be significant at 0.01 per cent level. There was a significant difference among households with regard to household vulnerability dimension and occupation.

For the present investigation, household vulnerability, housing conditions, electricity facility, sanitation facilities, ventilation facilities and assets were tested at 1 and 5 per cent levels of significance. It was found that, there exists a significant difference among sanitation facilities with occupation of the respondents. Hence, null hypothesis was rejected and alternate hypothesis was accepted. It can be concluded that vulnerability levels would be different as per the occupation of the respondents.

Table: 12. Analysis of variation for family income differences in household vulnerability dimension

Household vulnerability dimension	Source of variation	Sum of Squares	df	Mean Square	F	Sig.
Household vulnerability	Between Groups	78.084	4	19.521	.946	.439 NS
	Within Groups	3176.344	154	20.626		
	Total	3254.428	158			
Housing conditions	Between Groups	47.959	4	11.990	1.468	.214 NS
	Within Groups	1257.375	154	8.165		
	Total	1305.333	158			
Electricity facility	Between Groups	.121	4	.030	.193	.942 NS
	Within Groups	24.106	154	.157		
	Total	24.226	158			
Sanitation facilities	Between Groups	4.479	4	1.120	1.691	.155 NS
	Within Groups	102.621	155	.662		
	Total	107.100	159			
Ventilation	Between Groups	3.160	4	.790	.360	.837 NS
	Within Groups	340.084	155	2.194		
	Total	343.244	159			
Assets	Between Groups	10.110	4	2.527	2.356	.05*
	Within Groups	166.290	155	1.073		
	Total	176.400	159			

**- Significant at 0.01 level,*- Significant at 0.05 level, NS- Non-Significant

H_0 3: There exists no relationship between family income and household vulnerability dimension

Conferring to the household's vulnerability dimension, Analysis of variance was performed among households. The 'F' value was found to be significant at 0.05 per cent level. There was a significant difference among households with regard to household vulnerability dimension and family income.

For the present study household vulnerability, housing conditions, electricity facility, sanitation facilities, ventilation facilities and assets were tested at 1 and 5 per cent levels of significance. It was found that there exists a significant difference among assets with family income. Hence, null hypothesis was rejected and alternate hypothesis was accepted.

It can be inferred that vulnerability levels would be different as per the income of the family.

Table: 13. Analysis of variation for caste (social group) differences in household vulnerability dimension

Household vulnerability dimension	Source of variation	Sum of Squares	df	Mean Square	F	Sig.
Household vulnerability	Between Groups	217.285	2	108.643	5.754	.004**
	Within Groups	2907.734	154	18.881		
	Total	3125.019	156			
Housing conditions	Between Groups	54.590	2	27.295	3.459	.034*
	Within Groups	1215.078	154	7.890		
	Total	1269.669	156			
Electricity facility	Between Groups	2.747	2	1.374	10.216	.000**
	Within Groups	20.705	154	.134		
	Total	23.452	156			
Sanitation facilities	Between Groups	14.580	2	7.290	12.594	.000**
	Within Groups	89.723	155	.579		
	Total	104.304	157			
Ventilation	Between Groups	1.157				.765 NS
	Within Groups	334.698	2.150	1.940	.147	
	Total	335.854	1.108			
Assets	Between Groups	4.300				
	Within Groups	171.776	155			
	Total	176.076	157			

**- Significant at 0.01 level,*- Significant at 0.05 level, NS- Non-Significant

H_0 4: There exists no relationship between caste and household vulnerability dimension

According to the household's vulnerability dimension, Analysis of variance was performed among households. The 'F' value was found to be significant at 0.01 and 0.05 per cent levels. There was a significant difference among households with regard to household vulnerability dimension and caste.

For the present study household vulnerability, housing conditions, electricity facility, sanitation facilities, ventilation facilities and assets were tested at 1 per cent level of significance and 5 per cent level of significance. There exists a significant difference among household vulnerability, housing conditions, electricity facility and sanitation facilities with caste. Hence, null hypothesis was rejected and alternate hypothesis was accepted. It can be concluded that vulnerability levels would be different as per the caste (Social group) of the respondents.

Table: 14. Analysis of variation for additional income differences in household vulnerability dimension

Household vulnerability dimension	Source of variation	Sum of Squares	df	Mean Square	F	Sig.
Household vulnerability	Between Groups	36.567	3	12.189	.587	.624 NS
	Within Groups	3217.861	155	20.760		
	Total	3254.428	158			
Housing conditions	Between Groups	5.108	3	1.703	.203	.894 NS
	Within Groups	1300.226	155	8.389		
	Total	1305.333	158			
Electricity facility	Between Groups	.718	3	.239	1.577	.197 NS
	Within Groups	23.509	155	.152		
	Total	24.226	158			
Sanitation facilities	Between Groups	12.394	3	4.131	6.805	.000**
	Within Groups	94.706	156	.607		
	Total	107.100	159			
Ventilation	Between Groups	2.381	3	.794	.363	.780 NS
	Within Groups	340.863	156	2.185		
	Total	343.244	159			
Assets	Between Groups	2.775	3	.925	.831	.479 NS
	Within Groups	173.625	156	1.113		
	Total	176.400	159			

**- Significant at 0.01 level,*- Significant at 0.05 level, NS- Non-Significant

H_0 5: There exists no relationship between additional income and household vulnerability dimension

Analysis of variance was performed among households according to the household's vulnerability dimension. The 'F' value was found to be significant at 0.01 per cent levels. There was a significant difference among households with regard to household vulnerability dimension and additional income.

For the current study household vulnerability, housing conditions, electricity facility, sanitation facilities, ventilation facilities and assets were tested at 1 per cent level of significance and 5 per cent level of significance. There exists a significant difference among sanitation facilities with additional income of the respondents. Hence, null Hypothesis was rejected and alternate hypothesis was accepted. It can be inferred that vulnerability levels would be different as per the additional income of the respondents.

Table: 15. Regression for independent variables on dependent variable household vulnerability/capital

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t-value	*p*-value
		B	Std. Error	Beta		
1.	(Constant)	49.626	2.048		24.233	.000[NS]
	Education	.244	.258	.096	.949	.344 [NS]
	Occupation	.225	.299	.071	.752	.453 [NS]
	Caste	-1.372	.533	-.229	-2.575	.01**
	Family income	-.349	.412	-.067	-.849	.397 [NS]
	Additional income	.467	.440	.087	1.061	.290 [NS]
a. Dependent Variable: Household capital						

**- Significant at 0.01 level,*- Significant at 0.05 level

H_0 6: There is no association between education, occupation, caste, family income, additional income and household vulnerability dimension.

Multiple linear regressions was used to test the association between education, occupation, caste, family income and additional income with household vulnerability of the respondents.

There was a significant association found between caste and household vulnerability. Hence, null hypothesis was rejected and alternate hypothesis was accepted. It implies that caste of the respondents had a relationship with household's vulnerability.

Conclusion:

It was concluded from the study that, household component had deficits in household assets i.e., dwelling conditions (Stable shelter, year of construction, type of construction, location or orientation of the plot, No. of floors and rooms, ventilation and lighting), for which the index was 0.5, which predicts average vulnerable housing conditions. Assets components included facilities like easy access to dwelling, sanitary facilities, electricity facilities, possession of vehicles and accessories like refrigerator, TV, Radio, AC/cooler, mobile phone etc. The index of household assets was 0.3, which means that they have high vulnerability, infers that majority of them need to adopt more coping strategies to reduce their work load and live comfortably. The other component of household include, rent payment risks, evacuation threat etc., was found to have index of 0.9 which means that the threats are very less.

It was also found that household vulnerability would be different by various attributes like education, occupation, family income, additional income and caste. It was also found that among the parameters of household vulnerability i.e. housing conditions, electricity facility, sanitation facilities, ventilation and assets- sanitation facilities were found be different by all independent

variables except family income. Caste seems to be the emerging factor to affect household vulnerability.

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