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Socio-economic profile of dryland farmers in climate-vulnerable districts of Telangana

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Abstract

Dryland agriculture in Telangana is highly vulnerable to climate variability due to its semi-arid climate and heavy dependence on rainfall. Understanding the socio-economic and psychological characteristics of farmers is essential for designing effective climate adaptation and extension strategies. The present study was conducted in four highly climate-vulnerable dryland districts of Telangana namely Mahabubnagar, Wanaparthy, Gadwal and Nagarkurnool during 2023-24. A descriptive research design with multistage sampling was adopted and data were collected from 240 farmers using a structured interview schedule.

The results revealed that a majority of farmers belonged to the middle-aged group, had primary to middle school education, small family size, medium farming experience and semi-medium to medium landholdings. Borewells and tubewells were the predominant sources of irrigation. Most farmers exhibited medium levels of extension orientation, mass media utilization, economic motivation, scientific orientation, risk orientation, management orientation and adoption of soil and water conservation practices. The findings provide a comprehensive profile of dryland farmers in climate-vulnerable regions of Telangana and offer baseline information for designing location-specific climate-resilient extension interventions.

Keywords: Dryland farmers, Socio-economic profile, climate vulnerability, Telangana, extension orientation, irrigation

1. Introduction

Climate change has emerged as one of the most critical challenges to global agriculture, with disproportionate impacts on rainfed and semi-arid farming systems. In India, nearly two-thirds of the population depends directly or indirectly on agriculture, making rural livelihoods highly sensitive to climatic variability. Increasing temperature, erratic rainfall patterns and frequent extreme weather events have already begun to disrupt crop production, livestock rearing and allied sectors.

Telangana is particularly vulnerable due to its semi-arid climate, high dependence on rainfed agriculture and declining groundwater resources. Dryland districts such as Mahabubnagar, Wanaparthy, Gadwal and Nagarkurnool experience recurrent droughts, irregular monsoons and soil degradation, leading to reduced productivity and increased livelihood insecurity. Understanding farmers' perception of climate change is crucial, as perception strongly influences adaptation behaviour and technology adoption.

2. Materials and Methods

2.1 Research Design and Area

A descriptive research design was adopted. The study was conducted in four dryland districts of Telangana—Mahabubnagar, Wanaparthy, Gadwal and Nagarkurnool—during 2023-24.

2.2 Sampling Procedure

Multistage sampling was employed. From each district, two mandals and two villages per mandal were selected. Thirty farmers were randomly selected from each village, yielding a total sample size of 240 respondents.

3. Methodology

3.1 Measurement of Variables

Nineteen independent variables namely age, education, family composition, farming experience, landholding, source of irrigation, adoption of soil and water conservation practices, extension orientation, mass media utilization,

attitude towards climate-resilient practices, change proneness, training received, perceived drought frequency, decision making ability, credit orientation, economic motivation, scientific orientation, risk orientation and management orientation were measured using standardized and previously validated scales. The respondents were classified into low, medium and high categories based on mean and standard deviation wherever applicable.

4. Results and Discussion

4.1 Profile of farmers characteristics in the study area

Data presented in *Table 1* revealed the complete profile characteristics of the farmers from the entire study area.

Table 1: Socio-economic, psychological, and farming characteristics of farmers in the study area

S. No.	Characteristics	Categories	Response (n=240)	
			f	%
1	Age	Young Age (<35 years)	74	30.83
		Middle Age (35-55 years)	116	48.33
		Old Age (> 55 years)	50	20.83
2	Educational Status	No schooling	50	20.80
		Primary school	60	25.00
		Middle school	55	22.90
		High school	40	16.70
		Intermediate	20	8.30
		Graduation	10	4.20
		Post graduation and above	5	2.10
3	Family Composition	Small (<4 members)	144	60.00
		Medium (4-8 members)	61	25.40
		Large (> 8 members)	35	14.60
	Mean=6 S.D.=2			
4	Farming Experience	Low farming experience (<10 years)	78	32.50
		Medium farming experience (10-20 years)	100	41.67
		High farming experience (>20 years)	62	25.83
	Mean = 15 S.D. = 5			
5	Land Holding	Marginal landholding (< 1 hectare)	20	12.50
		Small landholding (1-2 hectare)	40	16.67
		Semi medium land holding (2-4 hectare)	85	35.42
		Medium landholding (4-10 hectare)	65	27.08
		Large landholding (> 10 hectare)	30	8.33
6	Source of Irrigation (as climate adaptation efforts)	Borewell & Tubewell	174	72.50
		Open well	46	19.16
		Canals	20	8.33
7	Extent of adoption of SWC practices	Low adoption (<10)	64	26.60
		Medium adoption (10-20)	116	48.33
		High adoption (>20)	60	25.00
	Mean =15 S.D. =5			
8	Extension orientation	Low extension orientation (<7 contacts)	78	32.33
		Medium extension orientation (7-14 contacts)	109	45.66
		High extension orientation (>14 contacts)	53	22.00
	Mean = 10.5 S.D. = 3.5			
9	Mass media utilization	Low mass media utilization (<14)	52	21.70
		Medium mass media utilization (14-20)	108	45.00
		High (>20)	80	33.33
	Mean = 17.48 S.D.= 4.73			
10	Attitude towards climate resilient practices	Unfavourable (<15)	56	23.33
		Moderately favourable (15-30)	105	43.75
		Highly favourable (>30)	79	32.92
	Mean =23.70 S.D. = 9.30			
11	Change proneness	Low change proneness (<11)	60	25.00
		Medium change proneness (11-16)	130	54.17
		High change proneness (>16)	50	20.83
	Mean = 13.5 S.D.=2.5			
12	Training received on climate related issues	One day training	100	41.67
		Short- term training	80	33.33
		Medium- term training	40	16.67
		Long- term training	20	8.33
13	Droughts prediction as perceived by farmers	Once in 4 years	110	45.83
		Once in 3 years	80	33.33
		Once in 2 years	30	12.50
		Yearly once	20	8.33

14	Decision making ability	Low decision making (<3.15)	92	38.33
		Medium decision making (3.15-6.02)	106	44.16
		High decision making (>6.02)	42	17.50
	Mean=4.58 S.D.=1.44			
15	Credit orientation	Low credit orientation (<2.47)	64	26.67
		Medium credit orientation (2.47-3.62)	78	32.50
		High credit orientation (>3.62)	98	40.83
	Mean= 3.14 S.D.= 0.81			
16	Economic motivation	Low economic motivation (<14)	70	29.29
		Medium economic motivation (14-22)	120	50.21
		High economic motivation (>22)	49	20.50
	Mean =17.3 S.D. = 4			
17	Scientific orientation	Low scientific orientation (<14)	76	31.67
		Medium scientific orientation (14-22)	100	41.67
		High scientific orientation (>22)	64	26.67
	Mean = 17.6 S.D. = 6.1			
18	Risk orientation	Low risk orientation (<7)	79	32.91
		Medium risk orientation (7-9)	118	49.16
		High risk orientation (>9)	43	17.91
	Mean=5.74 S.D. = 2.79			
19	Management orientation	Low management orientation (<5)	84	35.00
		Medium management orientation (5-10)	105	43.75
		High management orientation (>10)	51	21.25
	Mean = 7.09 S.D. = 2.21			

4.1.1 Age
The age of farmers helps us understand their experience and ability to make decisions. As shown in *Table 1* most farmers (48.33%) belonged to middle-aged (35-55 years) group, followed by younger farmers (30.83%) and older farmers (20.83%) groups.

4.1.2 Education Status
As it could be inferred from *Table 1*, that most of farmers have only gone to primary school (25.00%), closely followed by those with middle school education (22.90%), and no schooling at all (20.80%). Fewer farmers have completed high school (16.70%) or gone beyond to intermediate studies (8.30%). Very few have achieved graduation and post-graduation degrees (6.30%). The findings are similar with those of Archana (2012) [1].

4.1.3 Family Composition
The family size of the respondents varied, as shown in *Table 1*, a majority of farmers (60.00%) belong to small families with less than 4 members, followed by who have medium families (25.40%) with 4-8 members. The remaining (14.60%) had large families with more than 8 members. Farm families have traditionally been large, however farm family size has declined over the years owing to several reasons such as land fragmentation, seeking non-farm employment, migration and preference for small families owing to policies discouraging large families. The results of the present study are in line with the findings of the study conducted by Nkondze *et al*., (2013) [7].

4.1.4 Farming Experience
The distribution of respondents based on their farming experience is presented in Table 1, it could be observed that significant portion of the farmers (41.67%) had medium farming experience, ranging from 10 to 20 years, followed by (32.50%) of farmers who had low experience, while (25.83%) had relatively high experience, with greater than 20 years in farming.

4.1.5 Land Holding
The landholding pattern of respondents, as presented in *Table 1*, indicates that 35 per cent of farmers fell under the semi-medium category (2-4 ha) of landholding followed by medium (4-10 ha) landholding with (27.08%). Smallholder farmers (1-2 ha) comprised of (16.67%), while marginal-farmers with less than 1 ha made up (12.50%). Large farmers, owning over 10 ha, accounted for the smallest proportion at (8.33%). This data highlights a predominance of semi-medium and medium landholders, with fewer farmers in the marginal and large categories. The current result collaborated with the research findings of Shanabhoga 2019 [11].

4.1.6 Source of Irrigation
The data from *Table 1*, reveals that the primary source of irrigation among respondents was borewells & tubewells accounting for (72.50%). Open wells were the second most common source (19.66%), while canals served only (8.33%) of the farmers studied. These findings highlight the predominance of groundwater-based irrigation methods over surface water systems.

4.1.7 Extent of adoption of soil and water conservation practices
The extent of adoption of soil and water conservation (SWC) practices among the respondents is displayed in *Table 1*. Nearly half of the farmers (48.33%) showed a medium level of adoption, followed by a low level of adoption (26.60%) and a high level of adoption (25.00%). The results of the present study are in line with the findings of the study conducted by Nazneen (2023) [6].

4.1.8 Extension Orientation
Table 1 and convey., that most (45.66 %) of the respondents had medium extension contact followed by low (32.33 %)

and high (22.00 %) extension contact respectively.

4.1.9 Mass Media Exposure
Data depicted in *Table 1* shows that higher percentage of about (45.00%) of the sample subjects of the study had medium mass media exposure while one third and over one fifth (21.70 %) low levels of exposure to mass media.

4.1.10 Attitude of farmers towards climate-resilient practices
Table 1, shows that nearly one third of respondent's farmers had highly favourable attitude towards climate resilient practices while about 44 per cent had moderately favourable attitude favourable followed by (32.92%) and (23.33%) of respondents were had highly favourable and unfavourable attitude.

4.1.11 Change Proneness
Table 1 shows that a majority (54.17%) of the respondents had medium level of Change Proneness' followed by those with low (25.00%) and high (20.83%) levels of Change Proneness.

4.1.12 Training received on climate related issues
About 42 per cent respondents had opportunity to attend one day training while about of third of them received short term trainings and about 17 per cent medium term training courses. Only 8 per cent of the respondents had undergone long term training courses on climate related issues. This calls for more efforts to impart in depth training to farmers in climatically vulnerable areas.

4.1.13 Perception of farmers on the frequency of drought occurrence
The data in *Table 1*, reveal that farmers' perception of drought occurrence was quite varied. About 46 per cent felt that droughts occurred once in 4 years, while one third of the respondents recalled them occurring once in 3 years, only about (12.50 %) reported droughts once every 2 years. Those remaining reported drought occurrence almost every cropping season seem to be suggesting that they experienced moisture stress, that affected crop yields at least once during the cropping season.

4.1.14 Decision Making Ability
The 'Decision-Making Ability' of respondents followed a normal distribution *(Table 1)*. About 44 per cent of respondents had medium level Decision Making Ability followed by low (38.33 %) and high levels (17.50 %) of Decision-Making Ability. This follows more or less the same trend as in the distribution of respondents on educational status. For better education enables one to make more prudent decisions.

4.1.15 Credit Orientation
The data in *Table 1*, reveals that credit orientation of the respondents in the study area, a significant proportion of farmers (40.83%) exhibited high credit orientation followed by medium (32.50 %) and low-level (26.67 %) credit orientation. Farmers willingness to avail credit and invest it in agricultural enterprises is particularly important as building farm-level resilience is capital intensive.

4.1.16 Economic Motivation
The variable 'Economic Motivation' of respondents in the study, as it could be inferred from *Table 1*, highlighted that over half (50.21%) of respondents had medium level Economic Motivation followed by low level (29.29%) and high level (20.50%) of Economic Motivation.
The medium level of economic motivation observed in 50% of respondents may stem from a balanced aspiration to improve their economic status while facing limitations such as resource constraints, moderate exposure to opportunities and climate change. The low level of economic motivation among some respondents could be due to limited awareness, lack of access to economic incentives, or cultural and psychological barriers that discourage risk-taking.

4.1.17 Scientific orientation
The data in *Table 1*, reveals that about 42 per cent of farmers exhibited a medium level of scientific orientation, followed by low (31.67%) and high (26.67%) scientific orientation. There is enough evidence that individuals with high level of scientific orientation tend to adopt measures to alleviate the challenging conditions. This characteristic is highly desirable for taking measures to adopt climate resilient farming practices thereby reducing vulnerability to climate change. The results of the present study are in line with the findings of the study conducted by Shankara (2015) [12].

4.1.18 Risk Orientation
The data in *Table 1*, indicates that nearly half of respondents (49.16%) had medium level of risk orientation followed by low (32.91%) and high-level (17.91%) risk orientation.
Studies have time and again shown that farmers who are better oriented to risks have better chances to succeed in adverse conditions. For, those who are averse to risk often fail to cope with changing conditions, which holds quite aptly for climate change scenario. The results of the present study are in line with the findings of the study conducted by Shankara (2015) [12].

4.1.19 Management Orientation
The data in *Table 1*, shows a significant portion of farmers (43.75%) exhibits a medium level of management orientation, followed by low level (35.00%) and high-level (21.25%) management orientation. The results of the present study are in line with the findings of the study conducted by Shankara (2015) [12].

Conclusion
The present study provided a comprehensive socio-economic profile of dryland farmers in climate-vulnerable districts of Telangana. The majority of farmers belonged to middle age groups, had low to moderate levels of formal education, medium farming experience and semi-medium to medium landholdings. Dependence on groundwater irrigation through borewells and tubewells was predominant. Most respondents exhibited medium levels of extension orientation, mass media utilization, economic motivation, scientific orientation, risk orientation, management orientation and adoption of soil and water conservation practices.
The findings indicate that while farmers possess moderate

adaptive and managerial capacities, there exists considerable scope for strengthening their technical knowledge, institutional linkage and exposure to climate-resilient practices. The socio-economic profile generated through this study serves as a baseline for designing targeted extension interventions aimed at enhancing climate resilience of dryland farming systems in Telangana.

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