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Socio-economic and psychological characteristics of Gaja cyclone affected coconut growers in Tamil Nadu

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Abstract

The past decade witnessed many disasters, especially with the cyclones wreaking havoc in agriculture. Severe cyclonic storm Gaja destroyed lakhs of coconut trees in the Delta region of Tamil Nadu. The need for identifying and understanding the Socio-Economic and Psychological characteristics of the affected coconut growers was clearly evident and was taken up for the study. A sample of 211 farmers selected based on Proportionate Random Sampling method in Thanjavur district of Tamil Nadu, were interviewed for the study. A set of twenty-two variables were considered for the study based on opinion from expert judges and pilot study. Considering the Socio-Economic and personal characteristics, majority of the respondents were old aged, had exposure to school education at the least, carried out farming as their sole occupation, while possessing medium to high experience in farming and coconut cultivation. There existed a significant difference between the farm size and the area under Coconut cultivation. Majority of the respondents lived in tiled and terraced houses while three fourth of them had medium level of annual income. Regarding the communication characteristics, more than half of the had medium information seeking behaviour, while social participation was found to be low. Psychological characteristics such as fatalism, innovativeness and economic motivation was found to be medium among more than half of the respondents. This study involving the Socio-Economic and Psychological characteristics yielded a vast range of findings, sufficient enough to understand the background of the coconut growers affected by the Gaja cyclone.

Keywords: Socio-economic, psychological, profile, disaster, cyclone

Introduction

Tamil Nadu is historically one of the most vulnerable states to Tropical cyclones. The State is multi-hazard prone, the major natural hazards being Cyclonic storms, Urban and rural floods and periodic droughts. The severe cyclonic storm Gaja made landfall across the Tamil Nadu coast on November 11, 2018 with high wind speeds averaging 100 to 120 kms. More than 7 districts located in the Cauvery Delta region and the surrounding areas faced heavy damage to agriculture and property (NDMA, 2019) [4]. Coconut farms faced severe damage due to the storm, causing breakage and uprooting of trees. Thousands of farmers were affected across the state, affecting more than four million coconut trees.

Rakotobe *et al.*, (2016) [7] observed that small holder farmers are highly vulnerable to cyclones and experience significant crop losses, food insecurity and income loss when cyclones hit. Coconut was one of the main sources of agricultural production in Thanjavur district. A whopping 85.00 per cent of coconut production in the affected areas were destroyed in the cyclone (Arumugan *et al.*, 2019) [1]. Since Coconut is a perennial crop, it created a major impact among the farmers, robbing their income for the next few years.

Relief to the tune of ₹ 409.28 crores have been provided to 57,429 farmers in Thanjavur district alone, along with compensation for damaged houses (Deccan Chronicle, 2019). Damodaran (2015) [3] stated that cent percent of the affected farmers expected additional relief funds from the Government.

Studies have been undertaken to assess the impact of the Gaja cyclone and the various disaster phases were explored. In this context, it is important to understand the socio-economic and psychological background of the coconut growers affected by the cyclone as it governs the quality of life they lead. Assessment of Socio-Economic and Psychological characteristics may serve the purpose for researchers and policy makers to understand, appreciate and draw policies in alignment with the outcome of this study. Considering the scenario, a full-fledged study on the Socio-Economic and Psychological characteristics of coconut growers affected by the Gaja cyclone was undertaken and presented as follows.

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Methodology

Since the event had already happened and the investigator had no control over it, Ex Post facto research design was adopted for the study. The study was carried out in Thanjavur district of Tamil Nadu, which faced severe damage to the coconut farms. Four blocks of the district with the highest damage i.e., Pattukottai, Madukkur, Peravurani and Sethubavachatram were considered for the study. A sample of 211 coconut growers were chosen by Proportionate Random Sampling method.

A thorough review of past literature related to disasters was carried out and a set of 45 variables were listed out. It was sent to a total of 50 judges for expert opinion and the first 30 responses were considered. Based on their opinion, 25 variables were shortlisted and tested with pilot study in non-sample area of the affected district. Based on the outcome of pilot study, a final set of 22 variables were considered for the actual study. Percentage analysis and Cumulative frequency

was adopted to assess the variables empirically. Cumulative Square Root of Frequency provides higher efficiency in determining strata boundaries. This method was proposed by Raghavarao (1987) ^[6] to categorize the respondents into low, medium and high groups based on the total score obtained by the respondents. Paired 't' test was employed specifically on few variables to study the differences between them.

Results and Discussion

The independent variables were subjected to scrutiny and classified into categories such as Socio-Personal, Socio-Economic, Socio-Psychological and Communication characteristics based on their nature. Attempt were also made to assess the difference among specified variables to understand the variations over a period. The primary data in relevance with these variables were collected, analysed and presented as follows.

Table 1: Distribution of respondents according to their Socio-Personal characteristics

n= 211

S. No.	Variables	Frequency	Percentage
1.	Age		
(i)	Young	11	5.20
(ii)	Middle	55	26.10
(iii)	Old	145	68.70
2.	Marital Status		
(i)	Married	209	99.10
(ii)	Un married	2	0.90
3.	Family Size		
(i)	Up to 4 members	123	58.30
(ii)	More than 4 members	88	41.70
4.	Educational Status		
(i)	Illiterate	10	4.70
(ii)	Can read and write	1	0.50
(iii)	Primary level	40	19.00
(iv)	Middle level	45	21.30
(v)	Secondary level	68	32.20
(vi)	Higher Secondary level	43	20.40
(vii)	Collegiate level	4	1.90
5.	Occupational Status		
(i)	Farming as sole occupation	178	84.40
(ii)	Farming + Agricultural labour	23	10.90
(iii)	Farming + business	10	4.70

The Table 1 represents that more than two-third (68.70 per cent) of the respondents belonged to the old aged category. It was followed by more than one fourth (26.10 per cent) of the respondents who belonged to the middle-aged category, while only meagre (5.20 per cent) respondents belonged to the young category. The findings reinforce the fact that agriculture in current scenario, is still in the hands of the previous generation farmers. They integrally own the sector, especially in coconut cultivation. Globalization and Liberalization era has pushed the current generation youth towards discovering new opportunities around the globe, strengthened by their access to education and exposure to sophisticated lifestyles.

The Table 1 shows that a vast majority (99.10 per cent) of the coconut growers were married, while only a meagre (0.90 per cent) number i.e., two of the respondents alone weren't married during the time of investigation. The probable reason could be well attributed to the age group of the respondents where majority of them belonged to the middle and old aged group.

It is evident that only a meagre (4.70%) number of coconut growers were illiterate and only one (0.50 per cent) respondent had reported that he can read and write without formal education. The findings reflect the situation where only meagre number of respondents didn't have educational exposure due to various reasons. It is obvious that majority (92.90%) of the respondents had exposure to school education at different levels, given the prevailing positive environment in the state with respect to education. Irrespective of the financial situation of the families, awareness regarding the importance of education and the incentivizing policies of the state encouraged the people to get exposed to school education at the least.

The Table 1 also discloses that majority (84.40 per cent) of the coconut growers possessed farming as their sole occupation, while only a meagre (10.90 per cent) number of respondents reported that they work as agricultural labour in addition to farming. Farming along with business activities were also reported by a meagre (4.70 per cent) number of the respondents. Considering the study area surrounding the

Cauvery delta region, farming is main occupation for most of the households. Though this fact applies to most parts of Tamil Nadu, lack of sources other than agriculture such as industrial presence and other employment opportunities in the

delta region remains a lacuna. Traditionally, farming remains the sole occupation for the most of the respondents across generations, mostly due to the robust farming output from paddy and coconut in the area for decades.

Table 2: Distribution of respondents based on their Farming experience and Experience in Coconut Cultivation

n=211

S. No.	Farming Experience				Experience in coconut cultivation		
	6. Category	Range	Frequency	Percentage	Range	Frequency	Percentage
(i)	Low	<24.28	41	19.43	<17.48	71	33.65
(ii)	Medium	24.28 – 32.46	112	53.08	17.48– 24.84	81	38.39
(iii)	High	>32.46	58	27.49	>24.84	59	27.96
Total			211	100		211	100
Mean		7.37					
T value		16.48**					

**-One per cent level of probability

The table shows that more than half (53.08 per cent) of the respondents had medium level of farming experience while more than one fourth of the respondents (27.49 per cent) held high level of farming experience. Low level of farming experience was observed among less than one fifth (19.43 per cent) of the respondents.

As discussed earlier, majority of the farmers belonged to the middle and old aged category and had undergone school education. A point to be noted is that, majority of them had farming as the sole occupation. Considering that they might have started farming after schooling, it's obvious to witness medium to high level of experience in farming among majority of the respondents. The farmers who possessed low experience in farming might belong to the middle-aged category and had worked abroad for a considerable period of time before starting farming. The table emphasizes that a little lesser than two fifth (38.39 per cent) of the respondents had medium level of experience in coconut cultivation while more than one third (33.65 per cent) of them had low level of

experience in coconut cultivation.

The table also indicates that there exists a significant difference (t value = 16.48) between the farming experience and experience in coconut cultivation, with a mean difference of 7.37. It essentially means that the respondents had more overall farming experience compared to the experience they had in coconut cultivation. Considering the farming situation in the study area, paddy farming was the sole major crop before two to three decades. Various issues such as reduction in water availability and labour shortage pushed the respondent farmers to shift the crop from paddy to coconut. The transition happened over a period and this explains the difference in farming experience as a whole and the experience in coconut cultivation. Majority of the farmers in these four blocks sparsely served by the Cauvery River, opted coconut cultivation at one point of time and still holding to it. They are able to meet the irrigation needs through bore wells and also manage labour since coconut is not a labour-intensive crop.

Table 3: Distribution of respondents according to their Socio-Economic characteristics

n= 211

Socio-Economic variables			
S. No.	Category	Frequency	Percentage
1.	House owned		
(i)	Thatched house	28	13.30
(ii)	Tiled house	87	41.20
(iii)	Terraced house	87	41.20
(iv)	Terraced and tiled house	8	3.80
(v)	Terraced and thatched house	1	0.50
2.	Annual Income		
(i)	<1,96,009 (₹)	10	4.70
(ii)	1,96,009-3,94,749 (₹)	159	75.40
(iii)	>3,94,749 (₹)	42	19.90
3.	Farm Power		
(i)	Low (<9.90)	28	13.27
(ii)	Medium (9.90-11.17)	153	72.51
(iii)	High (>11.17)	30	14.22
4.	Material Possession		
(i)	Low (<14.54)	63	29.86
(ii)	Medium (14.54-17.09)	94	44.55
(iii)	High (>17.09)	54	25.59

The Table 3 shows the distribution of coconut growers based on the type of house they own and live in. More than two fifth (41.20 per cent) of the respondents owned a tiled house and an equal number (41.20 per cent) of them owned a terraced house in the study area. Terraced houses i.e., concrete houses

are the order of the day as it is sturdier and safer, while being preferred the most in spite of the cost involved. Peer pressure might also push the respondents to build terraced homes irrespective of their financial situation.

The Table 3 shows that more than three fourth (75.40 per

cent) of the respondents had medium level of annual income while less than one fifth (19.90 per cent) of them had high level of annual income. Coconut being a commercial crop, gradually yields better income to the farmer once it starts bearing. Unlike other seasonal crops, coconut contributes periodical income throughout the year after every harvest. This may explain the fact that majority of the respondents had reported medium to high annual income.

From the Table 3, it could be inferred that more than two third (72.51 per cent) of the coconut had medium level of farm power while less than one sixth (14.22 per cent) of the respondents possessed high level of farm power. The results are obvious because most of the respondents had at least basic farm implements such electric motor, pump set, crow bar and sickle etc. High level of farm power prevalent among few farmers might be due to the presence of tractor and hand sprayers. Most farmers prefer to hire the implements rather than owning it due to maintenance and utility issues.

It is clearly evident from the Table 3 that, more than two fifth (44.55 per cent) of the respondents had medium level of material possession while less than one third (29.86 per cent) of them belonged to the low category. Medium level of material possession can be explained by the fact that most of the basic things such as Television, Mobile phones, Bicycles and other home appliances have become more accessible and affordable. Possession of luxurious items such as Car, Motorcycles and Air conditioners may explain the high level of material possession among few respondents.

Table 4: Distribution of respondents based on their Farm size and Area under Coconut cultivation

n=211

S. No.	Category	Farm Size		Area under coconut cultivation	
		Frequency	Percentage	Frequency	Percentage
(i)	Small (<2.5 ac.)	54	25.59	72	34.12
(ii)	Medium (2.5-5 ac.)	136	64.45	125	59.24
(iii)	Large (>5 ac.)	21	9.95	14	6.64
	Total	211	100	211	100
	Mean	0.3			
	T value	6.93**			

** -one per cent level of probability

The Table 4 represents that more than half (51.70 per cent) of the farmers possessed medium landholding while more than one third (38.40 per cent) of them had small landholding. Only a meagre (9.90 per cent) number of respondents possessed large land holding.

The Table 4 also discloses that more than half (59.24 per cent) of the respondents possessed coconut farms in a landholding between 2.5 to 5 acres, while more than one third of them had planted coconut in a landholding less than 2.5 acres. It was also observed that only a meagre (6.64 per cent) number of respondents had coconut farms sprawling over five acres. Most of the farmers had coconut farms throughout their landholding, while few respondents had cultivated paddy in a part of their land based on availability of irrigation. The probable reason for majority of the respondents having coconut farms less than five acres could well be attributed to the existing land fragmentation scenario in our country.

It is evident from the Table 4 that there exists a significant difference (t value = 6.93) between the farm size and area under coconut cultivation, with a mean difference of 0.3 acre. As discussed earlier, the major shift from paddy cultivation to coconut plantation in the study area caused the initial spur.

Though it was a complete shift, few respondents had retained a portion of the wetland for paddy cultivation based on availability of water. Ownership of lands near the irrigation canal pushed the respondents to keep a part of land for seasonal cultivation of paddy and pulses. Though regular cultivation was not reported in those lands, coconut cultivation had remained in same landholding as how it was started during the shifting phase. These reasons probably explain the findings why there exists a difference between the farm size and coconut cultivation.

Table 5: Distribution of respondents according to their communication characteristics

n= 211

Communication Variables			
S. No.	Category	Frequency	Percentage
1. Information Seeking Behaviour			
(i)	Low (<24.71)	58	27.49
(ii)	Medium (24.71-28.08)	118	55.92
(iii)	High (>28.08)	35	16.59
2. Social Participation			
(i)	Low	66	31.28
(ii)	Medium	98	46.45
(iii)	High	47	22.27
3. Trainings Undergone			
(i)	Low (<4.41)	142	67.30
(ii)	Medium (4.41-7.05)	35	16.59
(iii)	High (>7.05)	34	16.11

The Table 5 represents that more than half (55.92 per cent) of the respondents possessed medium level of information seeking behaviour while more than one fourth (27.49 per cent) of the them had low level of information seeking behaviour. Medium to low level of information seeking behaviour observed among majority of the respondents can be explained by the lack of trustworthiness and less accessibility towards the cosmopolite and mass media sources. Considering the farming experience of the respondents, they choose to follow the traditional knowledge imparted across generations and experiment based on their own observations. Subsidies, schemes and training programs are some of the few factors which may elevate the need for seeking information from localite, cosmopolite and mass media sources.

It is clearly understood from the Table 5 that more than two fifth (59.24 per cent) of the respondents possessed medium level of social participation while a more than one fourth (31.28 per cent) of them had low level of social participation. Participation in social institutions either as a member or office bearer is common in cooperative society alone, while panchayat, farm associations and Self-help groups don't attract much participation from the respondents. Credit availability and input subsidies are some of the reasons why cooperative societies find much participation. Though self-help groups are operational across the study area, they remain idle except for the loan distribution. Water users' association in study area also witnessed sparse participation due to indifferences and conflicts within the farmers themselves. This explains the medium to low social participation of the respondents.

It is evident from the Table 5 that, more than two third (67.30 per cent) of the respondents had low level of trainings undergone. Absence of direct contact window between the training institutions and farmers may be a reason for low participation. Further, the choice of training location and content might also cause this despite proper dissemination of information.

Table 6: Distribution of respondents according to their Socio-Psychological characteristics

n= 211

Socio-Psychological variables			
S. No.	Category	Frequency	Percentage
1.	Fatalism		
(i)	Low (<6.18)	54	25.59
(ii)	Medium (6.18-7.35)	107	50.71
(iii)	High (>7.35)	50	23.70
2.	Innovativeness		
(i)	Low (<1.89)	59	27.96
(ii)	Medium (1.89-2.03)	132	62.56
(iii)	High (>2.03)	20	9.48
3.	Scientific Orientation		
(i)	Low (<20.67)	61	28.91
(ii)	Medium (20.67-22.89)	89	42.18
(iii)	High (>22.89)	61	28.91
4.	Economic Motivation		
(i)	Low (<20.97)	52	24.64
(ii)	Medium (20.97-23.93)	107	50.71
(iii)	High (>23.93)	52	24.64
5.	Risk Orientation		
(i)	Low (<21.52)	59	27.96
(ii)	Medium (21.52-23.98)	85	40.28
(iii)	High (>23.98)	67	31.75

It is observed from the Table 6 that more than half (50.71 per cent) of the respondents had medium level of fatalism while more than one fourth (25.59 per cent) of the them possessed low level of fatalism. Medium to low level of fatalism was observed among more than three fourth of the respondents. Except for the natural calamities and seasonal fluctuations, the respondents were optimistic that their efforts would be sufficient enough to evade the difficulties and challenges, which otherwise used to be considered as fate. Clarity of thoughts in their farming operations might give such optimism and confidence. This could well be the probable reason for medium to low level of fatalism.

The Table 6 also shows that more than three fifth (62.56 per cent) of the respondents had medium level of innovativeness, while more than one fourth (27.96 per cent) of them had low level of innovativeness. Though the respondents were receptive to the emerging technologies and innovations, most of them preferred to wait and assess the outcome before adopting it. The probable reason for this might be the lack of trialability in the emerging innovations in coconut crop. After the incidence of cyclone, most of the respondent farmers are interested in adopting new and different varieties of coconut in search of better yield and faster fruit bearing. These reasons may explain the medium level of innovativeness among the respondents.

It is evident from the Table 6 that more than two fifth (42.18 per cent) of the respondents had medium level of scientific orientation. Medium level of scientific orientation among the respondents might probably reflect their improved thrust on knowledge. Exposure to school education among most of the respondents created a positive environment for gaining scientific temper at the least.

The Table 6 discloses that more than half (50.71 per cent) of the respondents had medium level of economic motivation while an equal number i.e., one fourth (24.64 per cent) of the respondents each possessed low and high level of economic motivation respectively. Coconut being a commercial crop, farmers are naturally inclined towards achieving the best possible economic returns from the produce. As discussed earlier, majority of the farmers were exclusively involved in

agriculture and being dependent on it as a sole source of income. So, it's obvious that they stay economically motivated and try to extract maximum income out of farming, ultimately aiming for improvement in their standard of living. From the Table 6, it could be known that a little more than two fifth (40.28 per cent) of the respondents possessed medium level of risk orientation whereas less than one third (31.75 per cent) of them had high level of risk orientation. The farmers were better prepared to face the risks as and when they emerged. Rich experience in farming operations over the years and positive growth environment allows them to experiment with the cultivation aspects and carry out intensive farming while evading risks.

Conclusion

The study on Socio-Personal, Socio-Economic, Communication and Socio-Psychological characteristics of the coconut growers yielded a vast range of findings, sufficient enough to understand the background of the coconut growers affected by the Gaja cyclone. More than two thirds of the respondents were old aged, while majority of them had exposure to school education at the least and illiteracy was witnessed only in meagre numbers. Majority of the coconut growers were solely dependent on farming and had no other major sources of income. This probably emphasizes the need for encouraging and involving youth population in farming as we can expect them to be better equipped in managing the disasters.

Majority of the farmers owned at least a tiled or terraced house, while more than three fourth of them had medium level of annual income. Medium level of farm power and material possession was observed among more than two third and more than two fifth of the respondents respectively. Income generating sources have to be diversified in addition to farming, since it provides financial security against the vagaries of nature. Farm power is a potential impediment in adopting farm mechanization and advanced farming solutions. Medium level of information seeking behaviour was observed among more than half of the respondents while the social participation was found to be medium to low among more

than three fourth of the respondents. More than two thirds of the respondents had low training participation. These communication variables are bound to improve the awareness and decision-making pattern of the respondents in farming.

More than half of the respondents had medium to low level of fatalism while more than three fifth of them had medium level of innovativeness. Medium level of Scientific orientation was observed among more than two fifth of the respondents while the economic motivation was found to be medium among more than half of the respondents.

These findings emphasize the humble background of the cyclone affected farmers in the study area. Natural hazards such as cyclones and earthquakes do not have to become natural disasters. With proper planning, including proper environment management, much of the risk can be reduced (Okuyama, 2003) [5]. The findings and its due interpretation in disaster context might help the researchers and policy makers to understand and appreciate the behavioural aspects of the affected farmers and to formulate relevant strategies and solutions in disaster management. The ultimate motive remains in equipping the farmers with disaster preparedness, mitigation, response and recovery with respect to agriculture based on their social background.

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